

# Agency Sustainability Planning and Implementation Guide

## Commonwealth of Massachusetts State Sustainability Program

Prepared by the  
State Sustainability Coordinating Council &  
State Sustainability Program Staff

Mitt Romney, Governor  
Kerry Healey, Lieutenant Governor  
Ellen Roy Herzfelder, Secretary of Executive Office of Environmental Affairs  
2004



PUBLIC LEADERSHIP,  
STEWARDSHIP, COMMITMENT

# Acknowledgements

The State Sustainability Planning and Implementation Guide is a product of inter-agency collaboration, written by eight different committees of the State Sustainability Coordinating Council and State Sustainability Program staff. More than 50 individuals from 21 agencies met frequently over several months to research, write, and edit this document. Thanks also go to the Council Steering Committee and the Coordinating Council itself, both of which spent many hours reviewing and recommending changes to the Guide's format, content, and structure. These individuals and their agencies are listed below.

## State Sustainability Council and Committee Membership

State Sustainability Program Staff							
Eric Friedman, Director		Charlie Tuttle, Assistant Director			Jaclyn Emig, Project Manager		
Climate Change		Environmental Compliance			EPPs		
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Howard Bernstein	DOER	Bradley Lacouture	DEP	Jim Freer	DSS		
Dwayne Breger	DOER	Steven Miller	MassHwy	Eric Friedman	EOEA		
Richard Carey	DOC	Scott Murphy	DCR	Rob Garrity	OCD		
Andrew Ferraguto	CHE	Jenna Newcombe	MassPort	Stephen Long	DEP		
Eric Friedman	EOEA	Gus Ogunbameru	OTA	Dmitriy Nikolayev	OSD		
Sonia Hamel	OCD	Lauren Sloat	MWRA	Aditi Pain	UMass		
Christine Kirby	DEP	Raul Silva	DCR				
		Charlie Tuttle	EOEA				
Mercury Reduction		Natural Resources			Recycling		
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Jaclyn Emig	EOEA	Anne Monnelly	DCR	Jaclyn Emig	EOEA		
Carolyn Fiore	MWRA			Aditi Pain	UMass		
Scott Fortier	OTA			Meg Robertson	MCB		
Bill McGowan	OTA			James Ward	DCAM		
C. Mark Smith	DEP						
Julie Watts	DPH						
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Jaclyn Emig	EOEA	Walter Bickford	UMass	Tom Conneely	DOC		
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William Hicks	MassHwy	Robert Garrity	OCD	Mike Gildesgame	DCR		
Steven Miller	MassHwy	Cory Holmes	DPH	Mark Roberts	DCAM		
John O'Donnell	DCAM	Fabian Trudeau	POL				
Sam Overton-Bussell	DCR	Steve Long	DEP				
Gaby Sader	DOC	Jim Stolecki	MassPort				
Charlie Tuttle	EOEA	Gaby Sader	DOC				
State Sustainability Coordinating Council							
Dianne Wallace	BHE	Bradley Lacouture	DEP	Christine Cole	EOPS	Pam Heidell	MWRA
John DiModica	DCAM	Phil Weinberg	DEP	Todd Fontanella	EOTC	Lauren Sloat	MWRA
John O'Donnell	DCAM	Suzanne Condon	DPH	Geri Scoll	MBTA	Leon Lataille	MWRA
James Baecker	DCR	Ruth Alfasso	DPH	Rodney MacCormack	MBTA	Abbey Tennis	OCD
Scott Murphy	DCR	Gaby Sader	DOC	Steven Miller	MassHwy	Paul Richard	OTA
Samantha Overton-Bussell	DCR	Scott Durkee	DOER	William Hicks	MassHwy	Bill McGowan	OTA
Greg Cooper	DEP	Eric Friedman	EOEA	Catherine Wetherell	MassPort	Marcia Deegler	OSD
Arnold Sapenter	DEP	Charlie Tuttle	EOEA	Keith Beasley	MassPort	Fabian R. Trudeau	POL
Ann Lowery	DEP	Jaclyn Emig	EOEA	Rick McCullough	MTA	Walter Bickford	UMass
						Jody Hensley	UMass





# THE COMMONWEALTH OF MASSACHUSETTS

## EXECUTIVE DEPARTMENT

STATE HOUSE • BOSTON 02133

(617) 725-4000

MITT ROMNEY  
GOVERNOR

KERRY HEALEY  
LIEUTENANT GOVERNOR

Dear Agency Head:

I am pleased to send you the first edition of the *State Sustainability Planning and Implementation Guide*, prepared by the State Sustainability Coordinating Council. The enclosed document is the result of significant interagency collaboration over the past year.

This guide is intended to help you and your staff implement policies and practices that are both environmentally and economically sound. During these tough economic times, it makes sense for all agencies to be even more vigilant with regard to the efficiency of their own operations and take every step possible to reduce operating costs, especially where we can also see environmental benefit.

The opportunities to improve our environmental performance while reducing operating costs, while not always obvious, are clearly present in many of our facilities, some of which are over 100 years old. From energy efficiency to water conservation, recycling and environmental purchasing, agencies can engage in a wide range of sustainable activities that reduce the Commonwealth's emissions, lessen water withdrawal, decrease waste sent to landfills and incinerators, and conserve natural resources. These practices can also cut electricity costs, lower our waste fees, and reduce water and sewage bills and some of our purchasing costs. Clearly, this is a win-win situation for the environment and the taxpayer.

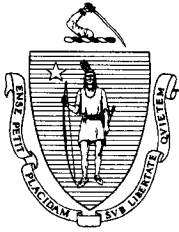
This guide will give you both long-term strategies to help plan for comprehensive sustainable practices as well as concrete examples of things you can do today to reduce your environmental impact and save money. It will also help you set up a process to ensure that gains made today continue into the future.

I encourage you to use this guide to drive your agency's sustainability efforts while improving upon the many sustainable activities in which you are already engaged. This effort can demonstrate the ability of state government to be a leader in the sustainability field and act as a model for other institutions in the Commonwealth. I look forward to seeing the results of your efforts in the months and years to come.

Sincerely,

A handwritten signature of Mitt Romney in black ink.

Mitt Romney



# THE COMMONWEALTH OF MASSACHUSETTS

## EXECUTIVE DEPARTMENT

STATE HOUSE • BOSTON 02133

(617) 725-4000

MITT ROMNEY  
GOVERNOR

KERRY HEALEY  
LIEUTENANT GOVERNOR

April, 2004

Dear State Employee:

Together with Governor Mitt Romney and Environmental Affairs Secretary Ellen Roy Herzfelder, I am pleased to present the State Sustainability Agency Planning and Implementation Guide. The Guide provides an array of information, strategies and actions you can use to improve environmental performance, save money, and advance key goals of the Romney Administration within your agency.

The Office for Commonwealth Development has an overriding interest in moving the Commonwealth toward development policies and practices that are sustainable and smart. The actions and goals outlined in this Guide take a significant step toward that end. In a clear and simple format, the Guide describes ways agencies can address the smart growth, fix-it-first and lean and green objectives of the Romney administration, while maintaining the Commonwealth's commitment to natural resource conservation and environmental protection.

From appropriate siting of state buildings, to vehicle use reduction strategies, to utilization of building techniques that minimize impacts on our water supply, there are many ways agencies can adhere to smart growth principles. Proper building maintenance and adoption of energy and water conservation practices will help prolong the life of existing buildings, minimizing the need for new construction. And these are only a few of the ways that focusing on conservation can dramatically reduce costs!

A successful sustainability strategy requires that we all work together. This is consistent with both the vision and reality in the Office for Commonwealth Development, where we have brought together the environmental, housing and transportation agencies to work toward shared objectives. This Guide also represents inter-agency collaboration, bringing together dozens of agencies and state employees to identify the key steps that will enable state government to work toward a more environmentally sound and sustainable future. The document's recommendations were prepared by the very agencies that will now implement them – clearly there is no reason every agency cannot meet the Guide's goals and objectives!

Achieving sustainability will not be easy. It will take commitment, planning and follow-through. But throughout our history Massachusetts has chosen to lead the way on environmental and other issues, and once again we have an opportunity to take a leadership role toward a better, smarter and greener future. I ask that you join with me, OCD agencies, and all your state colleagues in making the goals of the Agency Sustainability Planning and Implementation Guide a reality.

Sincerely,

A handwritten signature in black ink, appearing to read "Douglas J. Foy".

Douglas J. Foy, Secretary  
Office for Commonwealth Development



# *The Commonwealth of Massachusetts*

*Executive Office of Environmental Affairs*

*251 Causeway Street, Suite 900*

*Boston, MA 02114-2119*

MITT ROMNEY  
GOVERNOR

KERRY HEALEY  
LIEUTENANT GOVERNOR

ELLEN ROY HERZFELDER  
SECRETARY

Tel. (617) 626-1000  
Fax (617) 626-1181  
<http://www.mass.gov/envir>

Dear Colleague,

As Secretary of Environmental Affairs and co-chair of the State Sustainability Coordinating Council, I am pleased to share this *Agency Sustainability Planning and Implementation Guide* with your agency. This guide contains a wide range of creative, effective, and manageable strategies to help you and your staff develop and implement sustainable practices throughout your operations.

Between the effects of climate change on our ecosystems, the health impacts of mercury deposition, and the potential water shortages in many of our communities, there is no doubt that we face many serious environmental problems which we must begin addressing now. If we fail to take action, we will leave these and other problems for our children and grandchildren.

However, as you will see from this guide, there is much that is already being done - and much more that we can do - to reduce our emissions, minimize what we send to landfills and incinerators, and conserve our water and other natural resources. Offices within state government have a responsibility to demonstrate to Massachusetts that being truly sustainable is something an office of any size can do with a little foresight, planning, and good management.

Please take the time to read this guide and to think carefully about how these initiatives can be incorporated into your agency's operations. Working as a team, leaders in state government can significantly affect the environmental quality of our Commonwealth, improving the quality of life for our residents now and in the future.

I look forward to working with you on these matters and to seeing the growing number of success stories in the years to come.

Regards,

A handwritten signature in black ink, appearing to read "Ellen Roy Herzfelder".

Ellen Roy Herzfelder

# About the State Sustainability Program

## Mission

By integrating environmentally sustainable practices into state agency policies, procedures, and operations, and fostering collaboration across state government, the State Sustainability Program works to protect and enhance the quality of life for current and future generations of the Commonwealth. Leading by example, the Program strives to promote responsible management and effective stewardship of the Commonwealth's built and natural environments.

## Overview

In recognition of state government's environmental impact and its potential to address a number of environmental concerns, the State Sustainability Program was established in July 2002 by Executive Order No. 438 (E.O. No. 438). The Order calls on all state agencies to ***"work diligently and expeditiously to develop and implement policies and procedures to promote environmentally sustainable practices,"*** and established a governing Coordinating Council, made up of key agencies and offices. The full Executive Order No. 438 is available on the State Sustainability Program website at <http://www.mass.gov/envir/sustainable>.

## Structure

The State Sustainability Program is coordinated by staff at the Executive Office of Environmental Affairs, while priority setting and implementation strategies are managed through the State Sustainability Coordinating Council. The Council is chaired by the Secretary of EOEA and is made up of representatives of 15 key cabinet Secretaries, state agencies, and authorities. This Council meets on a monthly basis to establish priorities and implementation strategies for state sustainability. A full list of agencies on the Council is available in Appendix 1 of this document.

## Program Areas

A variety of subcommittees made up of Council Members, State Sustainability Staff, and other expert staff from Member agencies have been established to work on specific topic areas, including:

- Climate Change/Energy Efficiency
- Waste Prevention & Recycling
- Mercury & Other PBT Reduction
- Sustainable Design & Construction
- Water Conservation
- Environmentally Preferable Purchasing
- Environmental Compliance
- Natural Resource Conservation

## Contacts

For more information on the Massachusetts State Sustainability Program or the contents of this guide please visit the State Sustainability website or contact the Executive Office of Environmental Affairs, State Sustainability Program Staff:

**SS Website:** <http://www.mass.gov/envir/sustainable>

Eric Friedman, Director, State Sustainability,	<a href="mailto:eric.friedman@state.ma.us">eric.friedman@state.ma.us</a>
Charlie Tuttle, Assistant Director, State Sustainability,	<a href="mailto:charlie.tuttle@state.ma.us">charlie.tuttle@state.ma.us</a>
Jaclyn Emig, State Sustainability Project Manager,	<a href="mailto:jaclyn.emig@state.ma.us">jaclyn.emig@state.ma.us</a>

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# Glossary of Acronyms

AFV	Alternative Fuel Vehicle
BMP	Best Management Practices
BTU	British Thermal Unit
CAMIS	Capital Asset Management Information System, an inventory database of assets
CFL	Compact Fluorescent Lamp
CRT	Cathode Ray Tube
EMS	Environmental Management Systems
EPP	Environmentally Preferred Product
FEMP	Federal Energy Management Program
GHG	Greenhouse Gas
Greywater	Washwater such as bath, dish, and laundry water that can be processed for use on landscaping
HID	High Intensity Discharge lamps that utilize xenon gas
HIPPO	Habitat Loss · Invasive Species · Pollution · Population · Over Harvesting
HVAC	Heating, Ventilation, Air Conditioning
IPM	Integrated Pest Management
kWh	Kilowatt-hour
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development
LSPA	Licensed Site Professionals Association, Massachusetts
MRET	Massachusetts Renewable Energy Trust
NEG-ECP	New England Governors and Eastern Canadian Premiers
NHESP	Natural Heritage & Endangered Species Program
PBT	Persistent Bioaccumulative Toxin
RFR	Request for Response
Title 5	Title 5, 310 CMR 15.000 is the proper siting, construction, upgrade, and maintenance of on-site sewage disposal systems (septic systems).
USGBC	U.S. Green Building Council
VOC	Volatile Organic Compound
WasteCap	A statewide, non-profit organization working with the business community on recycling related programs
WasteWise	A free, voluntary, EPA solid waste assistance program
WRC	Water Resources Commission



# Glossary of Agency Names

BHE	Board of Higher Education
CHE	Soldiers Home, Chelsea
DAR*	Department of Agricultural Resources
DCAM	Division of Capitol Asset Management
DCR**	Department of Conservation and Recreation
DEP	Department of Environmental Protection
DFG	Department of Fish and Game
DFW	Division of Fisheries and Wildlife
DMR	Department of Mental Retardation
DOC	Department of Correction
DOER	Department of Energy Resources
DPH	Department of Public Health
DSS	Department of Social Services
DTE	Department of Telecommunications and Energy
EOEA	Executive Office of Environmental Affairs
EOPS	Executive Office of Public Safety
EOTC	Executive Office of Transportation and Construction
HRD	Human Resources Division
MassPort	Massachusetts Port Authority
MassHwy	Massachusetts Highway Department
MCB	Massachusetts Commission for the Blind
MTA	Massachusetts Turnpike Authority
MWRA	Massachusetts Water Resources Authority
OCD	Executive Office for Commonwealth Development
OSD	Operational Services Division
OTA	Office of Technical Assistance (EOEA)
POL	Massachusetts State Police
USEPA	U.S. Environmental Protection Agency

\*Department of Agricultural Resources (DAR) was formerly the Department of Food and Agriculture (DFA)

\*\*Department of Conservation and Recreation (DCR) was formed by the merger of the Department of Environmental Management (DEM) and the Metropolitan District Commission (MDC) on July 1, 2003

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# Section 1: Introduction and Background

## Using the Planning and Implementation Guide

The Guide is designed to help agencies understand the environmental and public health impacts of their day-to-day decisions and actions, and is intended to provide agencies with broad-based goals and specific actions that they can take to initiate sustainability efforts, while still providing necessary services and ensuring efficient and effective operations.

It is important to note that many of the strategies and actions recommended in the Guide can be implemented at little or no additional cost to an agency, while using existing staff and resources. Additionally, other strategies and actions that may have an upfront cost often reduce the operational costs of an agency, resulting in overall savings within a short time frame. When prioritizing strategies and actions for implementation, agencies should take into account the over-all cost of each activity and initially select those based on potential environmental impact, payback period, and ease of implementation.

The Guide is a living document and will be updated periodically by the State Sustainability Coordinating Council, either to provide up to date information for existing sections or add new sections on new topics. New sections will be posted on the State Sustainability website, <http://www.mass.gov/envir/sustainable>.

The Guide consists of three primary sections:

1. **Introduction and Background** - information on environmental issues of concern, sustainability principles and the rationale for establishing a state sustainability program.
2. **Sustainability Area Program Guidance** - eight sections describing specific environmental impacts and issues associated with human activity, long-term goals for state government, and specific strategies and action steps that agencies should take, where appropriate, to achieve state goals. The sections include:
  - Climate Change/Energy Efficiency
  - Waste Reduction and Recycling
  - Mercury and PBT Reduction
  - Sustainable Design and Construction
  - Water Conservation
  - Environmentally Preferable Purchasing
  - Environmental Compliance
  - Natural Resource Protection
3. **Agency Sustainability Planning** - a step-by-step guide to help agencies initiate and manage sustainability plans and implement internal sustainability programs.

Agencies should use the Guide to help them develop sustainability efforts and plans, but should also incorporate their own ideas into their programs. It is critical that agencies establish an ongoing process through which their efforts can be reviewed and improved upon.

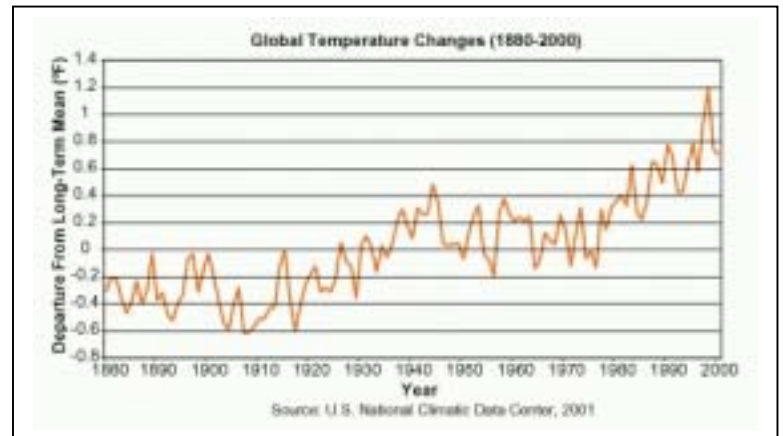
*Please Note:* While Executive Order No. 438 specifically applies to state executive agencies, the goals, strategies, and actions outlined in the Guide are intended for all Massachusetts state government operations, including authorities, higher education facilities, and other state offices. The term “agency,” when used in this Guide, is meant to be inclusive of all these state government entities.

## Environmental Concerns - Background

It is becoming increasingly clear that our society faces serious environmental issues locally, regionally, nationally and even globally. From concerns over climate change, to drought-related water shortages, to air quality in cities and towns, it is clear that environmental issues affect the quality of life in our communities and around the world.

### Global Issues

- 17 of the 18 warmest years recorded have occurred since 1980 (1998 was the warmest ever recorded).
- Sea level has risen 4 to 8 inches over the past century.<sup>1</sup>
- Americans generate over 230 million tons of waste per year, about 4.5 pounds per person per day, up from 2.7 pounds per person in 1960.<sup>2</sup>
- At current deforestation rates, the earth may lose about 25% of its species by 2050.<sup>3</sup>



### Regional Issues

- Stocks of many fish and other ocean species, including cod, haddock, lobsters, etc. have become seriously depleted as a result of over-harvesting by fishing fleets from various states and Canadian provinces. Severe restrictions on allowable catch are now in place as a result.
- Mercury emissions from solid waste incinerators and coal burning power plants have led to a significant regional mercury problem in rivers, lakes, ponds and streams. In 1998 the New England states and the eastern Canadian provinces developed a regional agreement to phase out and ultimately eliminate mercury from the waste stream.

### Local Issues

- Water use continues to increase faster than population growth due to new development and heightened demand. Certain rivers in Massachusetts run dry in the summer as a result.
- 105 solid waste landfills in Massachusetts have closed since 1993 and no new incinerators or landfills are being built. The DEP Solid Waste Master Plan calls for a 70% waste reduction rate by 2010.
- Invasive plant species are infiltrating Massachusetts at an alarming rate resulting in the loss of habitat diversity, the extinction of endangered species, and the choking of waterways and wetlands.

## State Government Scope and Impacts

By its very nature, the activities of state government in Massachusetts are varied and far-reaching. From provision of medical care and higher education, to operation of parks and recreation areas, to road and building maintenance and construction, Commonwealth agencies are involved in numerous activities ranging from purchasing, waste management, and building maintenance and operations, all of which consume resources and impact our environment. In addition to these operational activities, the Commonwealth manages hundreds of millions of dollars of road and building construction each year.

As the largest employer in the state with a \$23 billion operating budget in FY03, the executive branch of state government is responsible for overseeing:

92 million square feet of property	24 hospitals and regional medical facilities
Over 5,000 buildings	Over 12,000 highway lane miles
29 college and university campuses	Over 250 regional offices, depots, barracks
3,000 campsites	18 prison facilities with some 10,000 prisoners
Over 175 beaches, pools, courts and rinks	Over 8,000 light and heavy duty vehicles

The environmental impacts associated with the construction, maintenance and operations of these facilities are significant:

### Examples of Operational Environmental Impacts

<i>Agency Activity</i>	<i>Environmental/Health Impacts</i>
Energy consumption to heat and cool buildings and fuel vehicles	Greenhouse gas emissions, climate change, other air emissions, air quality
Day-to-day operations and public activities on state land, from office operations to state parks	Solid waste generation, incinerator emissions, mercury emissions, open space for landfills, energy use for appliances and equipment
Operation of labs, medical facilities, vehicle maintenance, print shops	Hazardous waste generation, indoor air quality
Water consumption for drinking, washing, and landscape management	Ecosystem and habitat impacts, water quantity and quality
Pest management in state buildings, on state grounds, and along roadways to control insects, vermin, and weeds	Ecosystem impacts, water quality, indoor/outdoor air quality

While specific data on actual environmental impacts from state government activities are still being collected, information gathered so far demonstrates that state government impacts are significant and that government efforts can play a key role in statewide efforts to reduce environmental and health effects. In Fiscal Year 2002, agencies were responsible for:

- 1.3 million metric tons of CO<sub>2</sub> emissions - equivalent to the emissions generated by almost 250,000 cars in one year, or the amount of CO<sub>2</sub> that could be sequestered by 408,437 forested acres of land
- 47,000,000 vehicle miles traveled
- 1.2 million feet of used fluorescent lamps, 64,000 pounds of batteries and over 1,550 tons of electronic waste that included materials such as computers and monitors

In addition to the environmental impacts associated with the above activities, Massachusetts state agencies spend millions of dollars per year on the day-to-day management of their facilities. In Fiscal Year 2002, agencies spent the following:

<i>Amount Spent</i>	<i>Operational Activity</i>
\$87,881,201	Electricity
\$22,516,316	Natural gas
\$18,333,847	Fuel oil
\$14,505,831	Water and sewer costs
\$9,784,471	Hazardous waste management
\$9,314,795	Vehicle fuels
\$6,751,856	Solid waste management

## Massachusetts State Sustainability Program

In recognition of state government's environmental impact and its potential to address a number of environmental concerns, the State Sustainability Program was established in July 2002 by Executive Order No. 438 (E.O. No. 438). The Order calls on all state agencies to *"work diligently and expeditiously to develop and implement policies and procedures to promote environmentally sustainable practices,"* and established a governing Coordinating Council, made up of key agencies and offices.

### State Sustainability Program Committees

1. Climate Change/Energy Efficiency
2. Waste Reduction
3. Mercury Reduction
4. Sustainable Design
5. Water Conservation
6. Environmentally Preferable Purchasing
7. Environmental Compliance
8. Natural Resource Protection

The Massachusetts State Sustainability Program focuses on state agency operations and activities in order to:

- Address the environmental and health impacts associated with agency activities
- Incorporate long-range environmental planning into day-to-day operations
- Make government more efficient and reduce operating costs
- Incorporate the true environmental and health costs related to the construction, purchase, operation, maintenance, and disposal of buildings, goods, materials, etc. into agency decisions
- Establish state government as a model for other sectors
- Help ensure that future generations of Massachusetts citizens enjoy a quality of life at least as high as today's

A State Sustainability Coordinating Council (the Council), made up of 15 agencies and offices, directs the program and coordinates efforts with all agencies. Five additional entities have voluntarily joined the Council since its inception (see Appendix 1 for a full Council list). The Council meets monthly to set priorities and provide direction for sustainable activities at state agencies, and reviews recommendations from one or more of the eight committees that focus on various topics. Each member of the Council appoints one or more designees to participate in Council deliberations. For more information on the State Sustainability Program, go to: <http://www.mass.gov/envir/sustainable/>.

## Defining Sustainability

While it is not the intent of the Guide to create a new definition of sustainability, it is important that state government start with a common understanding of the sustainability framework and agree on an approach that encourages movement toward long-term sustainability.

The most commonly accepted definition of sustainability comes from the 1987 World Commission on Environment and Development Brundtland Report:

**Meeting the needs of the present generation without compromising the ability of future generations to meet their needs.**

While achieving sustainability is clearly an ongoing process, agencies may want to think about their activities within the context of the following long-term goals and principles:

### *Using Resources and Materials Efficiently and Wisely*

- ➔ Procure electricity from renewable sources
- ➔ Ensure that buildings and vehicles are the most efficient possible
- ➔ Recycle the vast majority of solid waste and minimize total waste generated
- ➔ Generate virtually no hazardous waste
- ➔ Ensure that local water bodies and water supplies remain of high quality are not depleted beyond nature's ability to manage and replenish ecosystems
- ➔ Manage all facilities in complete compliance with environmental and health regulations

### *Using Purchasing Power to Protect the Environment*

- ➔ Buy products that do not contain mercury or other persistent bio-accumulative toxins (PBTs) e.g. lead, mercury, PCBs & dioxin
- ➔ Ensure that new, and renovated, buildings and roadways are constructed in ways that minimize impacts on the surrounding environment
- ➔ Make purchasing, management, and operational decisions based on life-cycle costs that incorporate the true environmental costs as well as short-term and long-term economic impacts

### *Promoting Sustainable Decision Making Processes*

- ➔ Make staff aware of environmental and health issues as part of their normal routines
- ➔ Ensure that long-term environmental, health, and economic impacts are incorporated into decision making-processes

## Sustainable Development

Although not the primary focus of this Guide, sprawl issues are of major concern to many in the Commonwealth, and incorporating sustainable development principles into policies and programs is a high priority of the current Administration. In addition, Executive Order No. 438 states that all state agencies should, where applicable, "Ensure that planning efforts are consistent with Executive Order No. 385, Planning for Growth, and support the goals of Executive Order No. 418, Assisting Communities in Addressing the Housing Shortage." While some agencies may not have any involvement with how or where new development happens, others have clear impacts. From the location of buildings to the decision on whether to rehabilitate or build new, many agencies will play an important role in these issues. Agencies within the Executive Office for Commonwealth Development (EOEA, EOTC, and DHCD) are participating in a sustainable development action plan process, but other agencies should attempt to review and incorporate the Commonwealth Development Principles included in Appendix 2. For more information on sustainable development issues, visit <http://www.mass.gov/ocd>.





# Section 2: Sustainability Area Guidance

## Introduction

The areas in which state agencies can and should implement sustainable practices are many and varied. From the energy and water consumed, to the solid and hazardous waste generated, to the buildings we build, and the things we purchase, day-to-day government operations have an impact on the local, regional, and even global environments. This section provides information and potential actions in eight key environmental areas, all of which are highlighted in Executive Order No. 438.

While these areas are not meant to be exhaustive of all the possible environmental impacts associated with government activities, the Sustainability Coordinating Council has chosen them as priority areas where impacts are significant and possible actions can be immediately implemented. The agency strategies and action steps listed in this section are meant to guide agencies, however, agencies should use their own planning process to develop additional priority actions relevant to their own activities and operations.

Each program area (energy efficiency, waste reduction, mercury reduction, sustainable design, water conservation, environmentally preferable purchasing, compliance, and natural resource protection) is broken into four sections as follows:

- I. Introduction and Background*
- II. Environmental and Economic Benefits*
- III. Existing Efforts*
- IV. Goals, Strategies (Statewide, Agency), and Action Steps*

Sections I, II and III are designed to provide background on the issues, information on the associated health and environmental impacts, and a summary of possible benefits resulting from improved performance. Section IV consists of several components, which include:

- Statewide goals established by the Council
- Statewide strategies that will aid agencies in their efforts
- Agency strategies that may necessitate a change in agency policy or management practices
- Specific action steps that agency staff can take over the short term to begin implementing sustainable practices immediately, often at little or no additional cost.

Not all strategies or actions will be appropriate for all agencies - for example, a small office in the McCormack Building should not focus on building energy efficiency efforts, nor should a vehicle maintenance garage focus on paper recycling. However, all agencies should at least consider each suggestion carefully to determine which ones are applicable and feasible. While each program area has its own issues and strategies, agencies should make sure to address environmental and health impacts in a coordinated fashion. For example, it does not make sense to eliminate one type of toxic waste only to generate another, or to promote energy efficiency at the expense of indoor air quality. All these issues should be considered within a broader environmental and planning context. See Chapter III for strategies on establishing internal planning processes at individual agencies.

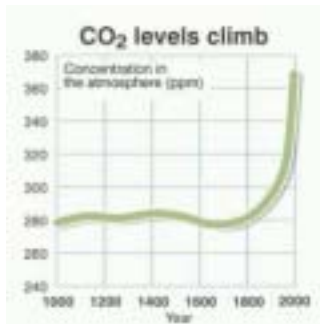
While the list of issues and actions may seem overwhelming, it is important to remember that achieving sustainability is a long-term and ongoing process. Agencies should identify their most significant environmental and health impacts, examine the feasibility and cost-effectiveness of addressing these impacts, and prioritize their actions accordingly.

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## Program Area #1: Climate Change/Energy Efficiency

### I. Introduction and Background

Global climate change, a change in the world's climate and weather patterns due to increases in carbon emissions from the burning of fossil fuels, has emerged as one of the most pressing environmental issues of today. Atmospheric concentrations of greenhouse gases (ghg), such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and other heat-trapping



gases are higher than they have been in thousands of years, allowing more heat to remain trapped in the earth's atmosphere, instead of reflecting back to space. Over the next century, climate change-induced changes in weather patterns in New England could result in flooded coastlines, loss of biodiversity, reduced drinking water supplies, and new threats from insect-borne diseases. These changes could also have serious effects on the local economy, affecting the health care, insurance, and tourism industries in particular.

The majority of human-produced ghg emissions are the result of energy use in the form of fuel oil and natural gas for heating and cooling of buildings, gasoline and diesel fuel for operating vehicles and machinery, and electricity for powering homes, buildings and other facilities. Significant ghg emissions reductions can be achieved by expanding energy efficiency practices, incorporating renewable energy sources such as wind power, solar photovoltaics, and biomass as well as purchasing fuel-efficient or alternative fuel vehicles, and reducing the number of miles driven.

Massachusetts state government has its own measurable impact on climate change. Through the maintenance and operation of 92 million square feet of space in 5,000 buildings, and 8,000 vehicles, Commonwealth agencies generated 1.3 million metric tons of ghg emissions from energy and fuel consumption in FY02, equal to 1.4% of total ghg emissions statewide. Through energy efficiency, use of renewable energy, and purchase of greener vehicles, significant opportunities exist for Massachusetts state government to reduce its impact on global climate change, reduce operating costs, and demonstrate the state's commitment to reducing the Commonwealth's impact on climate change.

### II. Environmental and Economic Benefits

In Fiscal Year 2002, state agencies spent over \$137.9 million on energy and fuels, consuming over 469 million kWh of electricity, over 12 million gallons of heating oil, and 3 million gallons of gasoline. This energy use resulted in 1.3 million metric tons of ghg emissions, the emissions equivalent of 249,000 average passenger cars in a year, or the amount of emissions that could be sequestered by 408,000 acres of forested land.<sup>4</sup> As almost 70% of these emissions are the result of energy use by facilities (35% of these from electricity use alone), reducing state building energy use is one of the most important ways to lessen state government's impact on climate change.

The economic benefits of investing in energy upgrades at a facility are so well established that many private Energy Services Companies are willing to finance the upfront cost of these projects through energy performance contracts, which allow a facility to pay for the upgrade costs over-time using the on-going energy savings



**CNG Buses**  
*The MBTA has committed to replacing 578 of its older, diesel run buses with cleaner-burning CNG (compressed natural gas) buses, significantly reducing air emissions.*

**DOC Energy Efforts**  
*The Dept of Correction reduced agency-wide electricity usage by 20% in 2002 through equipment retrofits and upgrades and behavioral changes.*





### Renewable Energy

*The wind turbine in Hull, MA provides enough power for all town streetlights, equivalent to the power needed by some 240 households. Wind power is priced competitively with fossil fuels, reduces our dependence on foreign oil and generates no emissions.*

### Alternate Fuel Vehicles

*Massachusetts State Government currently owns and operates:*

- 91 electric vehicles
- 127 dedicated CNG vehicles
- 144 bi-fuel vehicles
- 77 flexi-fuel vehicles



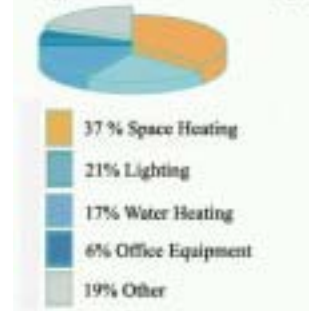
In Massachusetts, the Division of Capital Asset Management (DCAM) is responsible for designing, constructing, and renovating the 92 million square feet of buildings owned, leased, and operated by state agencies. As part of the agency's responsibilities, DCAM undertakes about half a dozen comprehensive energy and water conservation projects at large state facilities each year.

Smaller facilities that may not qualify for a performance contract can still significantly reduce their utility bills through a variety of energy efficiency practices, which can range from simple behavioral changes such as turning off lights when leaving conference rooms, to lighting retrofits, HVAC upgrades, and the installation of new insulation. Many of these measures have short payback periods of less than three years from the initial investment.

The environmental benefits of lowering energy consumption, switching to less polluting fuel sources for heating and cooling buildings and operating vehicles, and using renewable sources of energy are also significant and include:

- Reduced greenhouse gas emissions
- Fewer air pollutants such as sulfur dioxide and nitrous oxide, which are leading causes of acid rain and ground-level smog
- Reduced impacts on our natural resources associated with mining fossil fuels such as coal, natural gas and oil

Energy Use in Government Buildings



## III. Existing GHG Reduction and Energy Efficiency Efforts

Recognizing the importance of addressing climate change on a regional level, Massachusetts played an important role in producing the New England Governor's and Eastern Canadian Premiers' Climate Change Action Plan, a joint resolution on climate change submitted at the 2001 Conference of New England Governors and Eastern Canadian Premiers (NEG-ECP). Internally to state government, the DCAM Energy Conservation Team has been working with state agencies to achieve energy efficiency, water conservation, and resource protection in state facilities throughout the Commonwealth. As of the beginning of Fiscal Year 2004 the Team has coordinated 33 performance contracts for energy retrofits at facilities, resulting in a total cost-savings to the state of \$57.9 million, and ghg emissions reductions of over 350,000 tons of CO<sub>2</sub>.

In addition, smaller state facilities are taking advantage of utility rebates and free energy audit programs to implement small-scale retrofits at facilities. For example, the MassHighway Department conducted an electricity audit and retrofit at their District 4 headquarters in Arlington, resulting in a yearly savings of 26,689 kWh of electricity and \$2,668—less than a 2 year payback period.

Massachusetts agencies have been purchasing alternative fuel vehicles (AFVs) for government use since 1995, and currently own and operate 450 AFVs, ranging from electric, compressed natural gas to propane fueled vehicles, as well as several gas-electric hybrid vehicles.

## Greenhouse Gas Emission and Energy Efficiency Goal

*Reduce greenhouse gas emissions from state operations by 25% by 2012, based on a Fiscal Year 2002 baseline through energy efficiency and conservation, use of alternative fuels and renewable energy, and changes in employee practices.*

### IV. Greenhouse Gas Reduction Statewide Strategies

1. Reduce emissions from vehicles by use of cleaner fuels and technologies.
  - OSD's EPP Purchasing Program / DEP / DOER should revise the state vehicle procurement program, emphasizing the purchase and use of vehicles with reduced greenhouse gas emissions and lower tailpipe emissions profiles;
  - Transportation Agencies should continue to work to improve the availability of alternative fuel filling stations and publicize via the web the network of existing stations.
2. DOER, EOEA, and DCAM should collaborate on periodic agency-by-agency Greenhouse Gas Inventories, and calculations of individual facility energy and emission data, wherever possible, to establish priorities for energy reduction efforts.
3. DOER and EOEA should investigate the possibility of establishing a "retained savings program," allowing managers utilizing innovative efficiency savings methods to retain a portion of those energy savings for continuous facility improvement.
4. DOER and DCAM should provide guidance and technical assistance (create training seminars) for building and facility managers focusing on best energy conservation practices, and should create and maintain a "best practices" internet bulletin board for managers to share ideas and request help for particular projects.
5. DOER should develop a model employee-training module that may be used by state agencies to aid employees in achieving energy efficiency.
6. DCAM, EOEA, and DOER should identify opportunities on state properties and at state facilities to install equipment for distributed generation of electricity using renewable energy resources and technologies, as well as combined heat and power. These agencies should work with the Massachusetts Renewable Energy Trust to identify and possibly secure funding for such installations.
7. User agencies should identify opportunities at state facilities to install equipment or modify building envelopes to enable the use of solar energy for domestic hot water, space heating, and daylighting, as well as to reduce unnecessary solar heat gain during warmer months of the year. The User Agency should inform DCAM of these potential opportunities at the beginning of the Study Phase for new construction or major renovation, and DCAM will evaluate site conditions and present a discussion of the evaluation in the Study Summary Document.
8. EOEA, DOER, and OSD's EPP Purchasing Program should establish a statewide process to ensure the procurement of renewable electricity purchases by state agencies in order to reach the 10% renewable energy purchasing goal set by Governor Romney.

## V. Greenhouse Gas Reduction Agency Strategies

*To help reach climate change goals, agencies should:*

1. Review energy-intensive equipment, and replace old or inefficient equipment. Consult the Federal FEMP Greening Federal Facilities Guide <http://www.eere.energy.gov/femp/techassist/pdf/29267.pdf> for specific energy-reducing tips for equipment purchase and operations focusing on:
  - HVAC systems;
  - Water Heating;
  - Lighting;
  - Electric Motors and Drives;
  - Electric Power Systems.
2. Consider obtaining the ENERGY STAR label for energy efficiency at agency buildings. Eligibility requirements can be found on the ENERGY STAR website at [http://www.energystar.gov/index.cfm?c=eligibility.bus\\_portfolio/portfolio\\_eligibility/](http://www.energystar.gov/index.cfm?c=eligibility.bus_portfolio/portfolio_eligibility/).
3. Small facilities (<40,000 sq ft) should work with vendors on statewide contract #FAC22 Electrical and Lighting Supplies to perform energy audits and provide detailed energy and cost-saving recommendations at no cost to the agency.
4. Review any energy audits completed in recent years to assess level of follow-up done, and to implement recommendations not yet adopted.
5. Specify that contracts for client/patient transportation services include use of vehicles that are fuel-efficient, produce fewer emissions, and are appropriately sized for the purposes intended.
6. Develop protocols to ensure vehicle operators remain in compliance with Massachusetts DEP "anti-idling" regulations, 310 CMR 7.11(1)(b) <http://www.state.ma.us/dep/bwp/daqc/files/regs/7b.htm#11/> (where applicable).
7. Adopt the guidelines for purchase of clean and fuel-efficient outboard motors, as developed by the Executive Office of Environmental Affairs, [http://www.state.ma.us/envir/sustainable/resources/pdf/Resources\\_EPP\\_EOEA\\_BoatEngine\\_Policy.pdf](http://www.state.ma.us/envir/sustainable/resources/pdf/Resources_EPP_EOEA_BoatEngine_Policy.pdf).
8. Agencies with more than 250 employees at each facility should comply with the DEP's Rideshare Program regulations 310 CMR 7.16 <http://www.state.ma.us/dep/bwp/daqc/files/regs/7b.htm#16/> and develop programs to assist employees seeking commute alternatives to the single occupant vehicle such as carpooling, vanpooling, public transit, etc.
  - Agencies with fewer than 250 employees should consider offering appropriate support for Rideshare programs for each of their facilities.
9. Reduce business travel during work hours by increasing the use of virtual meetings, video conferencing, and conference calling.
10. Develop an equipment preventive maintenance plan that ensures the most efficient operation possible.



# Action Steps to Greenhouse Gas Reductions

A variety of short-term actions state facilities can take to reduce their environmental impacts.

1. **Close draperies or shades** during the day to block the sun in summer months, and keep them open in winter months, to reduce heating and cooling requirements.
2. **Turn off lights in offices**, conference rooms, kitchens, etc., when not in use—install motion detectors in rooms that are not used regularly.
3. **Ensure all landscapes are designed for energy efficiency:**
  - Properly positioning trees can save up to 25% of a building's energy consumption for heating and cooling<sup>5</sup>.
  - View the US DOE's "Landscaping for Energy Efficiency" for ideas:  
[http://www.state.ma.us/doer/pub\\_info/landscapeeee.pdf/](http://www.state.ma.us/doer/pub_info/landscapeeee.pdf/)
4. **Attend FREE online Energy Management training opportunities** available through the Federal ENERGY STAR Program
  - For more information and a list of trainings visit:  
[http://www.energystar.gov/index.cfm?c=business.bu\\_s\\_internet\\_presentations/](http://www.energystar.gov/index.cfm?c=business.bu_s_internet_presentations/)
5. **Enable Monitor Power Management** on all computers. The EPA estimates savings of 200 kWh per year per monitor, meaning an office with 100 computers could save \$2000 per year
  - EPA offers FREE software to enable monitor power management setting on all monitors on a network:  
<http://www.energystar.gov/powermanagement/>
6. **Replace inefficient incandescent lights** with more efficient alternatives, such as
  - **LED exit signs:** Replacing one incandescent sign can save 20-30 watts and major utility companies currently offer rebates for LED exit signs;
  - **Compact Fluorescent lamps (CFL):** Replacing a 100-watt incandescent lamp with a 27-watt CFL saves over \$60 over the life of the bulb.
7. **Reduce ghg emissions associated with driving:**
  - Drive more efficiently—each 5 mph a person drives over 60 mph is like paying an extra 10 cents per gallon for gas<sup>6</sup>;
  - Request the gas-electric hybrid vehicles from the state fleet when using a vehicle for work, or request hybrids when conducting a vehicle procurement;
  - Car-pool with other state employees or use public transportation when attending conferences, meetings, etc.;
  - Purchase/lease vehicles that meet the federal CAFE (Corporate Average Fuel Economy) standards (27.5 mpg for passenger vehicles, 20.5 mpg for trucks).
8. **Ensure that thermostats have good air circulation** around them so their sensors accurately detect the surrounding room temperatures.
9. **Operate equipment only when needed:**
  - Develop instructions for users of equipment to turn off equipment when not in use;
  - Perform periodic night and weekend audits to discover what equipment is operating that could be turned off (e.g., bathroom/desk lights, computers, printers, copiers, etc.).
10. **Promote casual dress during summer months** in offices with air conditioning, and set the thermostat 1-3 degrees higher, reducing the amount of energy required to cool the building.

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## Program Area #2: Waste Reduction and Recycling

### I. Introduction and Background

The Commonwealth of Massachusetts generated over 13 million tons of solid waste in 2000, of which over 40% was recycled. The remaining 60% was transported, handled, and disposed of in incinerators and landfills in Massachusetts. Although sophisticated

<b><i>How Municipal Solid Waste was managed in 1999 and 2000 (not including construction and demolition materials)</i></b>		
	<b>1999</b>	<b>2000</b>
<b>Recycled</b>	33%	34%
<b>Combusted</b>	39%	38%
<b>Landfilled</b>	13%	13%
<b>Net Exported</b>	15%	15%

incinerator technologies and proper landfill design and management can minimize environmental damage, there are still environmental and health impacts associated with these disposal methods ranging from emissions of mercury and dioxins, to use of valuable open space, to risk of groundwater contamination. Reducing the amount of

waste incinerated or landfilled can be accomplished through waste prevention, reuse, and recycling practices.

With tens of thousands of employees, and facilities that service hundreds of thousands of visitors, clients, patients and others, state operations generate thousands of tons of waste annually. As the Commonwealth works to encourage the diversion of waste from landfills and incinerators in the business and residential communities, it becomes increasingly important for state government to play a leadership role in setting the standard of performance for waste reduction and recycling progress by increasing waste diversion at state owned and operated facilities.

### II. Environmental and Economic Benefits

Reducing our waste, and recycling what waste we do generate to the maximum extent possible, provides both economic and environmental benefits for the Commonwealth and for state agencies. Waste reduction and recycling practices can:

- **Reduce the extraction of natural resources** and minimize the associated environmental hazards -- recycling one ton of paper saves between 15 and 17 mature trees<sup>7</sup>
- **Save energy and water** through the utilization of recycled materials in manufacturing processes - enough energy is saved by recycling one aluminum can to operate a television for 3 hours<sup>8</sup>
- **Preserve open space** by eliminating the need for more disposal capacity
- **Protect air and water resources** by reducing emissions from incinerators, and reducing generation of landfill gas, minimizing surface water run-off, and reducing generation of leachate which must be managed and treated from landfills.
- **Create local jobs and foster economic development** - regional studies estimate that recycling related business in Massachusetts employ over 19,000 people, and generate receipts of over \$3.5 billion and more than \$142 million in revenues for the Commonwealth annually<sup>9</sup>
- **Reduce disposal costs** by recycling more materials at a lower tipping rate
- **Reduce unnecessary equipment and supply purchases** by re-using existing supplies
- **Save money** by decreasing the amount of waste sent for disposal or recycling



**DEP Paper Savings**  
*The Department of Environmental Protection switched from distributing paper copies of daily news clips to an e-mail version. This change saved 175 cases of paper and some \$8,750 per year.*

**WasteWise**  
*EOEA, the Dept. of Correction, and the Bureau of State Buildings have all joined the EPA's WasteWise program, a voluntary effort that helps organizations save money by reducing waste and increasing recycling.*





**DCR Recycling**  
*In 2002 DCR piloted a can & bottle recycling program at Salisbury Beach. The plastic "bottle-shaped" recycling bins helped ensure that the bottles and cans collected were free of trash and other contamination.*

**UMass Recycling**  
*The University of Massachusetts Amherst Campus has a 50% recycling rate, saving 20,000 trees, 450,000 gallons of oil, and \$200,000 in avoided disposal costs each year.*



Municipal solid waste diverted from disposal in Massachusetts in 1999 is estimated to have:

- Reduced greenhouse gas emissions by 700,000 tons of carbon equivalent, equal to 13% of all industrial carbon dioxide emissions in Massachusetts annually
- Saved 22.5 trillion BTUs of energy, enough to power nearly 120,000 homes for a year<sup>10</sup>

By implementing successful waste prevention programs, agencies can avoid disposal costs altogether (e.g. leasing copier equipment or requiring reusable packing from vendors). Truly comprehensive prevention programs can also benefit from cost savings associated with not purchasing a product in the first place. By restructuring waste management contracts and increasing recycling, agencies can reap economic benefits by diverting materials away from disposal and reducing hauling fees. Recycling many materials can cost significantly less than the \$60 to \$100 per ton tipping fee for trash disposal.

### III. Existing Waste Reduction/Recycling Efforts

To address solid waste management within the state, the Executive Office of Environmental Affairs and Department of Environmental Protection developed the "Beyond 2000 Solid Waste Master Plan." The Plan lays out the Commonwealth's long-term strategy for managing solid waste and features the most aggressive goals for waste reduction in the country:

- Reducing the waste we produce by 70% through recycling and source reduction
- Removing toxics from the waste stream before recycling or disposal

A key component of the Commonwealth's efforts to reduce waste being sent to landfills and incinerators is a series of "waste bans" issued over the past 13 years by the DEP. These bans restrict the disposal of certain hazardous and recyclable items at solid waste facilities in Massachusetts. Disposal bans currently in place include: recyclable paper; glass, metal and plastic containers; leaves and yard waste; lead-acid batteries; whole tires; and cathode ray tubes (televisions and computer monitors). A ban on unsorted construction and demolition debris is currently under consideration. The DEP has a useful brochure called "Your Business and the Waste Bans: What You Need To Know" on their website at: <http://www.mass.gov/dep/recycle/files/wstban01.doc/>.

The Operational Services Division (OSD) has established a solid waste/recycling services contract (contract #ST1J391) to assist agencies in contracting for recycling and solid waste services. Many state agencies have successful recycling programs for a variety of materials. For example, the University of Massachusetts' Boston campus recycled approximately 140 tons of paper, 15.5 tons of beverage containers, 31.5 tons of cardboard, and 23.5 tons of computers and electronic equipment in 2002. In FY02 the Department of Correction created an agency-wide recycling policy, and is in the process of implementing paper, cardboard and metal can recycling at all facilities. The State Sustainability Program is currently working to collect better data about the extent of agency recycling programs, the amount of material recycled, and the potential for expansion.

## Waste Reduction/Recycling Goal

*In order to meet the goals of the Massachusetts Solid Waste Master Plan, state government will achieve a 50% recycling rate by 2010 and implement comprehensive and cost-effective waste prevention programs.*

### IV. Waste Reduction Statewide Strategies

1. The Recycling Committee of the State Sustainability Coordinating Council should compile relevant resources to assist agencies in developing and implementing waste reduction programs including:
  - Case studies and fact sheets on waste reduction;
  - Sample policies and programs;
  - Educational materials;
  - List of resources to assist with waste reduction programs;
  - Technical assistance and incentives;
  - Model recycling specifications for contracts and lease agreements.
2. The Operational Services Division (OSD) should disseminate information about the statewide recycling/solid waste contract and other contracts that may be accessed to assist and improve agency waste reduction programs.
3. OSD's EPP Purchasing Program should work with the Recycling Committee to ensure that reporting requirements for vendors are included on the statewide recycling/solid waste contract to help agencies meet the tracking and reporting requirements of the State Sustainability program.
4. OSD's EPP Purchasing Program should work with the Recycling Committee to ensure that the specifications for statewide contracts for goods and services are written in accordance with the state's overall waste reduction goals and targets.
5. OSD's EPP Purchasing Program should examine the state's surplus property program and contract to ensure equipment and furniture is reused or recycled to the maximum extent possible. The EPP Program should also research the possibility of including other common surplus office supplies in the program or should identify other potential non-profit organizations interested in this material.
6. DCAM will continue to work with MA DEP to ensure the specifications in vertical construction, demolition, and renovation contracts, as well as the building lease agreements, are in accordance, if practicable, with the Commonwealth's waste reduction goals and targets.
7. MassHighway should work with the Recycling Committee to ensure the specifications in horizontal construction, demolition, and renovation contracts are in accordance with the state's waste reduction goals and targets.

## V. Waste Reduction Agency Strategies

*To help reach waste reduction goals, agencies should:*

1. Become a member of the EPA's WasteWise Program - membership is **free**.
  - To receive a package of information on how to register contact:
    - EPA's WasteWise Program at 800-EPA-Wise or <http://www.epa.gov/wastewise/> or
    - MA Department of Environmental Protection (DEP) at 617-292-5500;
  - Establish practical and measurable waste reduction goals tailored to the agency's specific needs with the help of a WasteWise representative.
2. Consider conducting a waste assessment to identify the types and amounts of waste generated at facilities.
  - The waste assessment should be used to establish a baseline of solid waste and recycling generation for the agency including the volume of waste generated and costs to manage;
  - The waste assessment should be used to establish each agency's goals under the WasteWise program;
  - Waste Assessment Resources:
    - WasteWise has information on how to conduct a waste assessment at <http://www.epa.gov/wastewise/>
    - WasteCap of Massachusetts provides professional waste assessments for a nominal fee <http://wastecap.org/>.
3. Ensure that all waste ban materials, as identified by DEP regulations, are recycled at facilities.
  - A list of materials that have been banned from disposal in Massachusetts can be found on the DEP website at <http://www.mass.gov/dep/recycle/files/wstban01.doc/>;
  - Each agency should make information available to employees on how they can reduce and recycle waste generated in their homes and away from the office. (Community and material specific information available at <http://www.cleanup.org/>).
4. Review solid waste and recycling contracts to ensure they are written in a way to maximize efficiency and cost-savings, for example:
  - Modifying your contract to have "on call" pick-up of dumpsters, as opposed to a set time once or twice a week, will reduce the likelihood that you pay a full tipping fee for a half full dumpster.
5. Research the possibility of using Resource Management strategies to establish a program where reducing solid waste and increasing recycling is economically beneficial to the facility and the solid waste and recycling handling companies.
  - For more information on Resource Management and DEP's case study with the Lemuel Shattuck Hospital, visit DEP's website at <http://www.state.ma.us/dep/recycle/files/rm/rmcontr.htm>.

# Action Steps to Source Reduction

A variety of short-term actions state facilities can take to reduce their environmental impacts.

1. Establish and promote a double-sided printing policy to ensure that internal and external documents are printed 2-sided.
2. Require RFR bid submissions to be double-sided and ask for them without extraneous materials.
3. Establish designated office supply reuse centers or areas in offices to allow for unused or reusable supplies to be centrally available, such as:
  - Binders, file folders, staplers, paper clips, pens, notepads, and other office supplies.
4. Initiate a Paper and Postage Reduction Campaign:
  - Measure paper and postage usage and set a goal for reduction;
  - Establish procedures with the mail room to limit the use of high-cost, specialized mail delivery services—these include certified mail through the US Post Office, Federal Express, Emery Delivery, and others;
  - Use the state equipment contract *#OFF08 U.S. Postage Equipment* to buy special printers and software that allow agencies to save money and paper by taking advantage of USPS postal rates.
5. Utilize the web and other electronic media for distribution of documents and materials. For example:
  - Use e-mail distribution lists;
  - Use “Jump drives” - reusable portable memory - in place of cds for storing and transferring powerpoint presentations onto laptops;
  - Provide access to news clips and notes via a network and distribute using e-mail;
  - Store timesheets, invoices, and stationary electronically
6. Distribute information on how to reduce the amount of junk mail received within the agency—contact the DEP Bureau of Waste Prevention (BWP) <http://www.mass.gov/dep/> or visit the Direct Marketing Association (DMA) website and add your name to the “do not mail” file at <http://www.dmaconsumers.org/cgi/offmailinglistdave/>.
7. Use the state office equipment contract *#OFF02 Photocopier Equipment, Supplies & Service, Energy-Efficient* to purchase digital, duplex copy machines and laser printers. Set NEW and EXISTING machines’ default settings to duplex.
8. Use the state surplus property system to clean out unwanted materials from offices and to obtain needed office equipment. If you cannot use the state surplus property system, use the state contract *#OFF03 Office Furnishings* for remanufactured office furnishings.
9. Rent or lease equipment or supplies when possible, to reduce waste and save money
  - Rent-a-Crate, available on statewide contract *#OFF12 Boxes... Packaging Materials and Supplies*, offers reusable moving supplies on state contract and is up to 40% less expensive than purchasing boxes, reduces labor costs and allows more boxes to fit into each truckload.
10. Install carpet “tiles” to allow heavily used areas to be replaced more often than other areas, reducing the need to replace an entire carpet. Recycled content carpet, and carpet tile leasing opportunities, are available on statewide contract *#FAC25 Carpet and Flooring Products*.
11. Universities should hold end-of-year apartment and dorm cleanouts. Contact “Dump-and-Run” a non-profit organization that offers guidance and assistance on organizing a large-scale rummage sale on campus: <http://www.dumpandrun.org/> or call 508-579-7188 for additional information.



# Action Steps to Recycling

A variety of short-term actions state facilities can take to reduce their environmental impacts.

1. **Focus your recycling program** on the most commonly generated materials at your facility—these materials can be identified through a waste assessment and will provide the biggest “bang for your buck” when initiating a new program.
  - **Lawn and Leaf waste:** Agencies should encourage landscape contractors to “grasscycle” lawn clippings back into the lawn, and to compost other organic landscape waste.
2. **Consider using separate contractors for solid waste vs. recycling**, vendors specializing in recycling may be offer a better price for materials such as cardboard, white paper, and some metals.
  - A list of vendors on statewide contract *#ST1J3912 Solid Waste and Recycling Services* is available on the OSD website <http://www.mass.gov/osd/>.
3. **Take advantage of low-cost, easy-to-implement recycling programs**, such as:
  - **Glass, plastic, and aluminum beverage containers:** identify a local non-profit group that can pick up all beverage containers for free—for example, DMR’s Fernald School for the Blind offers free pick-up for deposit containers, and small amounts of non-deposit containers in eastern Mass. Contact Marilyn Norden at 781-894-3600 x 2270;
  - **White Paper:** some collection companies will collect high-quality white paper for free, and mixed paper for a minimal cost, depending on location, quality and quantity of the material—contact vendors on statewide contract *#ST1J391 Solid Waste and Recycling Services* for specific quotes;
  - **Rechargeable batteries:** The Rechargeable Battery Recycling Corp. (RBRC) offers free recycling for rechargeable batteries to public agencies—website includes educational materials and information on how to sign up, <http://www.rbrc.org/>. Contractors on the Industrial Supplies contract may also offer this service (Contract #FAC28);
4. **Solicit employee and cleaning staff ideas** to improve recycling through surveys, suggestion boxes, or contests and employee incentives—provide feedback to employees on the success of the agency’s recycling program.
5. **Provide incentives and recognition** to groups/individuals within the agency that substantially reduce waste generation within their programs or projects.
6. **Choose appropriate recycling bins** for specific materials, and place them in appropriate locations at the facility:
  - Placing recycling bins near trashcans reduces the likelihood that employees will throw trash into the recycling bin;
  - Choosing can & bottle recycling bins with beverage container- size holes in the top reduce contamination.
7. **Place large, clear signage** in appropriate locations throughout your facility to increase employee awareness of your recycling program—sample signs are available on the State Sustainability website <http://www.mass.gov/envir/sustainable/>.
8. **Avoid potential fines and liability by recycling all mercury-containing devices and/or cathode ray tubes (CRT’s)** such as computer monitors, electronics, batteries, fluorescent lamps, etc. using state contract *#FAC26 Collection and Recycling of Fluorescent Lamps and Mercury-containing Devices*.
9. **Obtain recycling data from haulers** and publicize results to employees and/or the public your agency serves.

## Program Area #3: Mercury and PBT Reduction

### I. Introduction and Background

Mercury is one of many persistent bioaccumulative toxins (PBTs), chemicals that persist in the environment and bioaccumulate in food chains, posing potentially long-term risks to human health and ecosystems. While mercury is found naturally in the environment, about two-thirds of the mercury in the atmosphere today is generated by human sources. Many common devices, including thermostats, automatic switches in appliances, compact fluorescent lights, and fever thermometers contain mercury, which is released to the environment when these products are disposed of in landfills or incinerated with household trash. In addition, liquid mercury, or mercury-containing solutions, disposed of down the drain can end up contaminating water bodies and fish. Even small amounts of mercury pollution can create a problem -- scientists report that the yearly input of only 1 gram (about the amount in one mercury fever thermometer) of mercury from the atmosphere is enough to cause unsafe mercury contamination in fish in a typical small lake or pond.<sup>11</sup>

Human exposure to mercury most commonly occurs through vapor inhalation, as a result of a spill or improper handling practices, or through the ingestion of contaminated fish. Data from a national exposure assessment by the US Centers for Disease Control indicates that in the U.S. almost **10% of women of child bearing age or over 300,000 newborn babies each year are being exposed**<sup>12</sup> to levels of mercury above those recommended by USEPA and the National Academy of Science. Eating contaminated fish, depending on the level of contamination and the amount eaten, can cause brain and neurological damage, particularly in young children and fetuses whose developing brains and neurological systems are especially sensitive to mercury.

Direct exposure to spilled mercury can also be very dangerous, and elevated mercury vapor levels have been detected years after a mercury thermometer had been broken. A mercury spill can require the removal and disposal of carpeting and other building materials as a hazardous waste. The building may need to be closed during spill evaluation and cleanup.

### II. Environmental and Economic Benefits

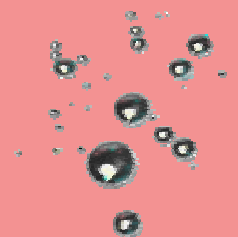
Considering that mercury is a regulated hazardous material, the removal of mercury-added products, purchase of non-mercury alternatives and proper labeling, handling and recycling of products with mercury that cannot yet be removed or replaced can provide important environmental and economic benefits. Such benefits include:

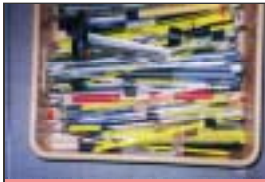
- Reduced health risks
- Reduced liability related to mercury exposure
- Avoided costs associated with mercury spill cleanup
- Avoided building closures and disruptions associated with spills and accidents
- Ability to maintain wastewater discharge criteria compliance, reducing the risk of violations
- Reduced storage, handling and permitting costs associated with storing mercury at a facility



**Fish Advisories**  
*Over 40% of the fish from Massachusetts lakes and ponds have enough mercury to require consumption advisories for all state residents.*

**Air Quality**  
*In one recent study, almost 10% of indoor sites investigated had air mercury levels above those recommended by USEPA.*





**Mercury Spills**  
*DEP and EOEA removed 471 lbs of mercury from the 41 schools visited. Products found included:*

- 1328 lab thermometers
- 456 fever thermometers
- 57 barometers
- 47 sphygmomanometers

**Mercury in Products**

*A mercury switch may contain 3.5 grams of mercury, fluorescent light bulbs may contain from 3.5-60 milligrams each, and a mercury thermometer may contain 1 gram of mercury. Non-mercury alternatives, such as digital thermometers, should be used when available, and any mercury-containing products should be properly handled and recycled.*



Longer-term statewide benefits include:

- Reduced pollution of water bodies
- Reduced contamination of fish, and fewer fish advisories
- Reduced health problems and their associated costs

The costs and benefits identified above can be significant, both statewide and to individual agencies. For example, a recent mercury spill as a result of broken fever thermometers at a school in Connecticut led to a two-day school closure, busing of students to temporary classrooms, and treatment of two-dozen students for potential mercury exposure. Clean-up costs for mercury spills in a school (and similar institutions) can range from \$5000 to \$250,000, much higher than the cost to identify and remove non-essential mercury.<sup>13</sup>

Most importantly, the hazards even low levels of mercury pose to human health and to the environment clearly demonstrate the benefits, and importance, of eliminating the use and disposal of mercury in state agency operations whenever possible.

### III. Existing Mercury/PBT Efforts

The Commonwealth is a national and world leader in addressing sources of mercury pollution. Because of new regulations, the Commonwealth of Massachusetts has seen a 90% drop in mercury emissions from municipal waste incinerators over the past five years and has proposed regulations to reduce mercury emissions from other sources such as coal-fired utilities. The Commonwealth has also implemented pollution prevention programs designed to remove mercury from schools and educate consumers about the dangers of mercury and available alternatives to mercury-added products. Massachusetts also played an important role in developing the New England Governor's Eastern Canadian Premiers' Mercury Action Plan, which establishes regional goals and strategies for "the virtual elimination of the discharge of anthropogenic mercury into the environment."<sup>14</sup>

State agencies have been active in reducing the amount of mercury entering the waste stream. The Operational Services Division (OSD) offers a statewide contract for recycling fluorescent lamps and other mercury-added items, and includes non-mercury-added alternatives in statewide contract specifications, where applicable. Between FY00 and FY03, public agencies recycled 3.9 million linear feet of fluorescent lamps, 3812 lbs of mercury-contaminated articles, and 565 lbs of elemental mercury through the statewide mercury recycling contract. Some examples of other state mercury reduction projects include:

- EOEA and DEP collected over 500 mercury thermometers from state employees in June 2002
- EOEA removed and replaced mercury-added switches from 99 vehicles from EOEA agency fleets
- Shattuck Hospital developed a plan to eliminate mercury from it's waste stream
- A mercury cleanout project supported by DEP and EOEA collected 471 lbs of elemental mercury from 46 schools<sup>15</sup>



## Mercury & PBT Reduction Goal

*Virtual elimination of the release of anthropogenic mercury and identification and prioritization of other PBTs in state government operations by 2005.*

### IV. Mercury Reduction Statewide Strategies

1. The Mercury Committee should develop and distribute self-assessment mercury checklists, inventory questionnaires, educational materials, and guidance on how to conduct an assessment to all agencies.
2. The Mercury Committee should identify the major sources of priority PBTs at state facilities, and prioritize the elimination of such toxins based on their potential hazards from the Toxic Use Reduction Program list.
3. OSD's EPP Purchasing Program should work with the Mercury Committee on targeting cleaning supplies and similar consumables that may contain mercury for elimination and replacement by non-mercury-added alternatives.
4. OSD's EPP Purchasing Program should incorporate zero-mercury language in all applicable statewide contracts for which non-mercury environmentally preferable alternatives are economically feasible.
5. OSD's EPP Purchasing Program and the Mercury Committee should work together to educate agency purchasing agents and other personnel on:
  - Mercury-added products and alternatives available through state contracts;
  - Mercury collection and recycling contracts available, with a particular focus on fluorescent bulb recycling.
6. OSD's EPP Purchasing Program should consider giving preference to the purchase of products: 1) labeled or otherwise bearing consumer information about their mercury content; and, 2) for which manufacturer-supported recycling programs have been established.
7. The Division of Capital Assets Management (DCAM) should ensure that all new and renovated state-owned facilities use non-mercury added thermostats, switches, or relays when available.
8. DCAM should require the removal and recycling of mercury-added items, such as thermostats, barometers, and switches, at all state-owned facilities during renovation and reconstruction, and replace them with mercury free alternatives. All mercury items should be properly recycled.
9. DCAM should ensure that new and renewed state leases include requirements for the recycling of fluorescent bulbs, HID lighting, thermostats, and other mercury added equipment, as practicable.

## V. Mercury Reduction Agency Strategies

*To help reach mercury reduction goals, agencies should:*

1. Purchase non-mercury alternative equipment and supplies when replacing older or purchasing new equipment/supplies, whenever feasible, including but not limited to: thermostats, thermometers, other medical devices, switches, meters, and other physical plant equipment, etc.
2. At medical and dental facilities, purchase equipment that contains NO mercury, when such alternatives exist (e.g. fever thermometers, sphygmomanometers, etc.).
3. Properly handle and recycle all mercury-added devices, including all fluorescent, High Intensity Discharge (HID), and other mercury containing lamps, in conformance with state and federal regulations.
4. Ensure that all facility managers are familiar with:
  - Non-mercury alternatives for equipment used in their facility, where applicable;
  - Type and location of all mercury added products and equipment, for which a non-mercury alternative is not available, used in their facility;
  - Proper handling procedures for mercury, which may include purchasing and training employees on the use of mercury spill kits for facilities or areas where an ongoing mercury spill hazard cannot be completely eliminated.
5. Hold clean-outs at all facilities as soon as possible to remove unused, surplus and waste mercury-added products identified in the assessments above.
6. Include a plan or contract language in every agency-directed renovation project to cover removal, replacement, and recycling of mercury- or other PBT-added materials (such as thermostats). Sample language developed by DCAM and the OSD EPP Program for their projects can be used or modified for a variety of projects. Renovations should be used as an opportunity to remove and properly dispose of these products and replace them with non-PBT-added alternatives.

# Action Steps to Mercury Reduction

A variety of short-term actions state facilities can take to reduce their environmental impacts.

1. Perform mercury assessments at all appropriate facilities—visit the state sustainability web site for simple facility checklists.
2. Ensure all fluorescent and HID light bulbs are recycled through the statewide mercury collection contract *#FAC26 Collection and Recycling of Fluorescent Lamps*. Fluorescent bulbs contain between 3.5-60 milligrams of mercury each, and must be managed as hazardous waste in Massachusetts through the Universal Waste Regulations [http://www.informinc.org/fact\\_P3fluorescentlamps.php](http://www.informinc.org/fact_P3fluorescentlamps.php).
3. Recycle thermostats, batteries, and other products with mercury added using the statewide mercury-recycling contract.
  - The Rechargeable Battery Recycling Corp. (RBRC) provides FREE recycling of mercury-added batteries, such as those found in cell phones, digital cameras, calculators, etc. Information and educational materials, signs, etc. are available on their website at <http://www.rbrc.org/>.
4. Identify, remove, and recycle any mercury convenience lighting switches from agency owned and operated vehicles. Replacement parts are available for less than \$1.00 each and the switch out procedure takes less than 5 minutes. Lists of specific vehicles makes/models that may contain mercury switches, and directions for replacement are available on the web at <http://www.cleancarcampaign.org>.
5. Keep mercury spill kits in a convenient, easily accessible location if your agency uses thermometers, sphygmomanometers, or other mercury-containing products. Train staff in the proper spill kit use.
6. Eliminate non-essential uses of mercury thermometers and sphygmomanometers at all medical facilities. Take advantage of mercury alternatives available through the OSD statewide contract *#HSP16 Medical and Surgical Supplies*.
7. Reduce the use and release of PBT chemicals from laboratories:
  - Investigate the use of microchemistry techniques, chemical substitution or other process changes to avoid the use of these chemicals;
  - Monitor end-of-use disposal practices for those PBTs that cannot be replaced or eliminated.
8. Survey all drinking water and wastewater treatment facilities for the presence of mercury-added switches and other devices and develop a plan to remove and replace with non-mercury-added products, or isolate them to prevent potential contamination.
9. Investigate the use of non-mercury dental filling materials or the use of a mercury separator for wastewater in facilities that offer dental care.
10. Purchase gas appliances with electronic ignitions. Gas fired appliances that have pilot lights, including ranges, ovens, clothes dryers, water heaters, furnaces/boilers, and heating equipment may contain mercury-added ignitions.

## Commonly Found Mercury-Added Products

Product	Found Here	Substitute or Proper Handling
Thermometers	Hospitals, laboratories, fever, candy, deep fry, oven, indoor, and outdoor thermometers with a silvery temperature indicator	Electronic, alcohol, or other types of non-mercury liquid thermometers
Thermostats	Office buildings, homes	Electronic models
Fluorescent Lamps	Indoor office lighting, backlit LCD displays	Recycle all mercury-added fluorescent lamps. LED (light-emitting diode) systems can replace backlit LCD displays
Switches	Found in electrical equipment, boilers, HVAC systems, utility rooms, etc.	Replace with mercury-free switches & relays, & gas equipment with electronic ignitions
Batteries	Button batteries from cell phones, older hearing aids, watches, calculators, pagers	Recycle all mercury-added batteries
Vehicles	Switches in trunk & hood-lights, and some 4-wheel drive anti-lock breaking systems (ABS)	
Gas-fired Appliances, Boilers & Heating Equipment	Gas-fired appliances that have pilot lights, including ranges, ovens, clothes dryers, water heaters, furnaces, and space heaters	Purchase gas appliances with electronic ignitions
Sphygmomanometers (blood pressure equipment)	Hospitals, medical facilities	Aneroid & electronic devices are available
Barometers	Schools, doctor's offices, weather stations	Digital & other mercury-free barometers are available

Source: INFORM "Mercury-Containing Devices and Products"

### Mass Statewide Contracts Offering Mercury-Free Product Alternatives

1. HSP16: [Medical and Surgical Supplies](#)
2. FAC28: [Industrial/Commercial Supplies](#)

### Mass Statewide Contract Offering Mercury Collection & Handling

1. FAC26: [Fluorescent Lamp, Ballast and Computer Recycling](#)

## Program Area #4: Sustainable Design and Construction

### I. Introduction and Background

Building construction, operation, and maintenance have a significant impact on the environment, and on the people who live, work, and study in them. Nationally, buildings account for 46% of sulfur dioxide emissions (contributes to acid rain), 19% of nitrogen oxide emissions (precursor to smog), and 36% of carbon dioxide emissions (major cause of climate change). Buildings consume 37% of all energy consumed in the U.S. and 68% of all electricity<sup>16</sup> while generating over 136 million tons of waste each year.<sup>17</sup> Worldwide, buildings account for 25% of the world's wood harvest.<sup>18</sup>

To address these and other impacts, governments, organizations, architects, builders, and others are promoting sustainable design and construction techniques for construction and renovation projects, as well as for the operation of existing buildings. Sustainable design is an integrated approach that focuses on 1) site location and impacts 2) water consumption 3) energy use and air emissions 4) waste and materials, and 5) indoor environmental quality. The most effective strategies typically involve a collaborative approach that incorporates design and technology/product choices early in the process. Ultimately, sustainable design does not require sacrifices in construction quality or aesthetics, increase costs, or place limitations on programmatic needs. Rather, sustainable design typically results in enhancing each of these characteristics.

### II. Environmental and Economic Benefits

The costs associated with maintenance, operations and employee productivity over a building's life far outweigh the capital construction costs. While the incorporation of sustainable design features may add to a project's initial cost, such features frequently lower a building's long-term operating costs, often paying for themselves in a few years. Sustainable design can also have far-reaching impacts on local, regional, national, and global environments, from slowing global climate change, improving air quality, reducing ozone depletion, to protecting natural resources.

Many of the economic benefits are clear. Using techniques like proper site orientation, tightening the building envelope, incorporation of daylighting and high performance windows, and designing offices that promote good air circulation will reduce the demands on the heating, ventilation and cooling system (HVAC), resulting in lower energy use and costs. Water efficient fixtures and greywater systems will reduce water and sewage charges; strategic placement of trees and building orientation can help keep the building cooler in the summer and warmer in the winter, again reducing energy costs and enhancing building comfort. Careful landscape design and management techniques, such as planting native species and reducing impervious surfaces can reduce water consumption and costs.

Other economic benefits may be more indirect or take more time to achieve but are important nonetheless. Using compounds and materials with low volatile organic compound (VOC) emissions can have significant impact on a building's indoor air quality, dramatically affecting the comfort, health, and productivity of employees, visitors, students, etc. Moreover, the cost of closing a building and relocating personnel and operations is far greater than any incremental cost associated with using less toxic materials. Combined with better daylighting and space planning, increases in productivity



**Cape Cod Community College**  
*DCAM registered its first LEED project for the New Technology Building at Cape Cod CC:*

*27 Kilowatts of solar PV*

*Greywater recycling system, Low VOC carpeting, paints, adhesives, sealants, etc.*

*Recycled plastic bathroom partitions*

*Dedicated recycling space.*

**MA Transportation Building**  
*The Massachusetts Transportation building was designed to use minimal energy for heating and lighting.*





#### LEED

*As of July 2003, 59 projects have achieved LEED certification in the U.S., and over 800 buildings are registered with LEED and on their way toward certification.*

**MTC Green Schools**  
*Salem's new Carlton Elementary School received a grant from the MTC to install 31 kW of solar photovoltaic cells and a small 1 kW wind turbine on the roof of the school. A variety of other energy-efficient features will also be included, as well as an educational program to teach students about "green" technology.*



can more than offset any incremental costs, sometimes leading to payback periods of one year or less. A Lawrence Berkeley National Laboratory study in 2000 found that "the potential national savings from health and productivity gains after indoor environmental quality improvements would fall between \$23 and \$56 billion."<sup>19</sup>

### III. Existing Sustainable Design Efforts

Nationally, there are significant efforts to make sustainable design the norm. The U.S. Green Building Council (<http://www.usgbc.org/>) has established the now widely accepted Leadership in Energy and Environmental Design (LEED) program, a building rating system that awards points in various design categories and rates a building based on the total number of points obtained. The USGBC has recently published a draft of a LEED rating system for existing buildings (LEED EB) and is piloting the new program during 2003. As of July 2003, more than 30 state, federal, and local government projects have been LEED certified.<sup>20</sup>

The Massachusetts Division of Capital Asset Management is responsible for designing, constructing, and renovating the vast majority of state property. In recent years, the agency has undertaken a formal effort to incorporate comprehensive sustainable design principles into construction and renovation projects, and has developed a set of sustainable development guidelines in its *Instructions for Designers (Form 9; Appendix N)* document. These guidelines are revised periodically to reflect best practices in sustainable design and ensure that DCAM incorporates such measures when technically and economically feasible.

DCAM is currently considering adoption of the LEED system as a mechanism to guide the design and construction of its projects. In an initial effort to gauge the effectiveness of the LEED system, DCAM now requires all designers working on new construction projects to submit at least one LEED-compliant scheme or design alternative (out of the three generally requested for each project) to be considered during a project's schematic design phase.

Recent DCAM projects have used low VOC paints, adhesives, carpeting, and other finish products. DCAM has also paid particular attention to energy efficient equipment and systems that go beyond the Massachusetts Energy Code, utilizing utility rebates and life cycle costing to install energy efficient heating, cooling, and lighting systems that significantly reduce energy consumption and costs.

In conjunction with DCAM, EOE, through a grant from the Environmental Protection Agency, coordinated a day long Sustainable Design Forum in 2002 that included over 25 state agencies, architectural firms, construction companies, and designers. The forum identified various barriers associated with sustainable design in public projects and developed preliminary recommendations to address them. For the final forum report, visit the 'Sustainable Design' link on the 'Resources' page of the state sustainability website: [http://www.state.ma.us/envir/sustainable/resources/res\\_main.htm](http://www.state.ma.us/envir/sustainable/resources/res_main.htm).



## Sustainable Design Goal

*To minimize the environmental impacts associated with the design, construction, operations, and maintenance of state facilities and roads, provide healthy, productive, high-performing buildings for state agencies, and reduce the long-term life cycle costs of all state buildings while meeting agency needs.*

### IV. Sustainable Design Statewide Strategies

1. DCAM staff should incorporate established sustainable design guidelines into all state construction projects by ensuring that:
  - All projects under its purview are designed and constructed in accordance with the requirements of *Form 9, Appendix N* (Sustainable Design Guidelines);
  - Relevant user-agency staff are aware of the requirements of *Appendix N* in all stages of each renovation and construction project;
  - Designers working on state projects are familiar with sustainable design principles and are required to demonstrate such familiarity as part of their responses to Designer Selection Board advertisements prior to their selection for state design contracts.
2. DCAM should consider adoption of the U.S. Green Building Council's LEED standard and DCAM staff should submit a report to the State Sustainability Council on the feasibility and cost implications of requiring LEED certification for all state projects.
3. DCAM should incorporate sustainable design language into all state leasing agreements, including:
  - Requirements on various operational measures, including, but not limited to, recycling of solid waste, proper disposal and recycling of fluorescent lamps, incorporation of energy and water efficiency measures, use of environmentally preferable products, and related items;
  - Specifications for private property owners to abide by the requirements of *Form 9, Appendix N* (Sustainable Design Guidelines) for all lease agreements that involve substantial deconstruction, renovation, or new construction.
4. DCAM should work with the State Sustainability Program to promote sustainable design techniques by:
  - Researching opportunities to educate and train DCAM and other state staff on sustainable design practices and their benefits;
  - Investigating ways in which sustainable design information and training can be disseminated to private designers, architects, builders, engineers, etc.;
  - Establishing tracking protocols to quantitatively measure the costs and benefits of sustainable design efforts;
  - Publishing information on the successes and achievements for all sustainable design and energy efficiency efforts, including case studies.

## V. Sustainable Design Agency Strategies

*To help reach sustainable design goals, agencies should:*

1. Incorporate sustainable design considerations into all agency projects including:
  - Ensuring that staff who work with DCAM on construction projects are familiar with DCAM's Sustainable Design Guidelines;
  - Communicating directly to DCAM during a project's early stages that the agency is interested in incorporating sustainable design techniques into the project;
  - Incorporating established Sustainable Design Guidelines into all construction activities when an agency is undertaking construction or renovation projects independent of DCAM.
2. Incorporate Sustainable Design Guidelines into all state leasing agreements including:
  - When an agency's lease is NOT subject to renewal in the near future, investigate opportunities to incorporate cost-effective sustainable practices into facility operations through their own efforts or through negotiations with their landlord;
  - When an agency's lease with a private landlord IS up for renewal, incorporate appropriate sustainable design measures in the new lease, especially those measures that reduce agency maintenance requirements, ensure agency environmental compliance, and potentially reduce lease costs. At a minimum, such measures should include:
    - fluorescent lamp recycling;
    - paper recycling;
    - simple, quick-payback, low-cost/no-cost energy efficiency measures such as lighting retrofits, LED exit sign replacement, and motion detectors on conference rooms and bathrooms.
3. Consider obtaining LEED certification under Green Building Rating System for Existing Buildings (LEED EB) (<http://www.usgbc.org/>).
4. EOTC, MASSPORT, and other agencies and authorities should include sustainable design principles in appropriate capital improvement and development projects.
  - These agencies should submit to the State Sustainability Coordinating Council a report with findings and recommendations on the inclusion of sustainable design principles into their projects, including feasibility, costs, benefits, and strategies required for the adherence to and implementation of such principles.



# Action Steps to Sustainable Design

A variety of short-term actions state facilities can take to reduce their environmental impacts.

1. Make sure HVAC systems and other large equipment are inspected and maintained on a regular basis.
2. Incorporate minimum sustainable design measures into any new lease agreement, including:
  - Paper and beverage container recycling;
  - Fluorescent lamp recycling;
  - Conducting an energy audit and implementing energy efficiency measures that can be financed through electricity savings;
  - Installing faucet aerators and low-flow toilets;
  - Utilizing low-VOC paint and other products that improve indoor air quality.
3. Educate employees about quick, effective ways they can improve a building's environmental performance while saving money, including:
  - shutting off lights when they leave a room;
  - turning off computer monitors and area lighting when going to lunch or long meetings;
  - shutting down computers at night;
  - participating in all available recycling;
  - fully turning off water in sinks.
4. Specify and use recycled and environmentally preferable building materials that have been included on state contracts (e.g. carpeting, office panels) or that have been designated by DCAM's *Sustainable Design Guidelines*.
5. Require building contractors to develop a waste management plan prior to renovation or demolition work in order to reuse or recycle as much construction and demolition debris as possible.
6. Check for and address mold problems prior to renovation and address them like asbestos - isolate and remove professionally see:  
[http://www.epa.gov/iaq/molds/mold\\_remediation.html](http://www.epa.gov/iaq/molds/mold_remediation.html).
7. Ensure that any renovations or new designs account for space required for recycling needs.
8. Publicize sustainable design and energy efficiency to staff, visitors, and clients so that they know the benefits, cost-savings and in what ways they can participate.
9. Have key design/construction staff properly trained in facilities management, energy efficiency, indoor air quality, and/or other related operations and maintenance programs.
10. Have key staff attend a LEED training sponsored by the U.S. Green Building Council <http://www.usgbc.org/> and consider having certain staff take the LEED Accredited Professional exam.

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## Program Area #5: Water Conservation

### I. Introduction and Background

Water is consumed by all sectors of society, from agriculture, to industry, to commercial and residential communities. It is used to sustain human life, grow plants, wash our bodies, cars, and buildings, sustain our landscapes, and keep machinery running. Though 97% of the earth is made up of water, only 1% is fresh water available for consumption. And consumption of water continues to grow at an alarming rate—during the 20th century, global demand for water increased six-fold, double the rate of population growth.

Despite the average 44 inches per year of precipitation in Massachusetts (more than double the average in California), increasing water withdrawals from rivers and streams are resulting in serious consequences. The Ipswich River, for example, periodically runs dry in the summer as increased water demand for lawns and landscapes overburden the river's ecosystem. In a recent build-out analysis conducted by EOEA, it was estimated that under potential development scenarios, demand for water in Massachusetts could grow from 740 to 1180 million gallons per day, a 60% increase. Based on current capacity, this would result in a water deficit of 320 million gallons per day. Although a worst-case scenario, it demonstrates the potential for water to become a serious concern in the future.

In addition to the impacts of water shortages on human activities, water use beyond the ecosystem's ability to replenish it has serious environmental consequences. Excessive withdrawals from lakes, ponds, and rivers can impair wetlands as well as other habitats that support a diversity of plant and animal species. Such withdrawals can also affect water quality by allowing contaminants to be drawn into drinking water supplies, raising water temperatures and lowering water levels.

Activities by state agencies use significant amounts of water throughout the state. Drinking water and washroom water is consumed by tens of thousands of employees, clients, visitors, and patients every day. Outdoor use of water for landscaping at thousands of state buildings, over 200 parks, 27 athletic fields, and two golf courses also contributes to significant water usage.

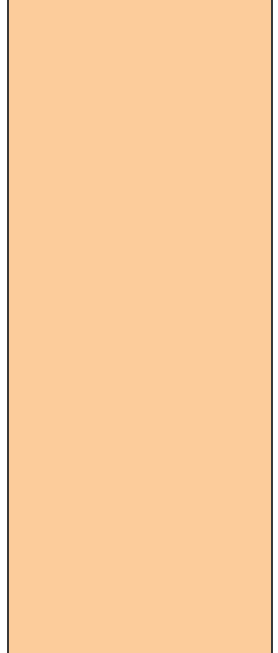
### II. Environmental and Economic Benefits

In Fiscal Year 2002, state facilities spent some \$14.5 million on water consumption and sewer operations. Conservation of water through use of more efficient equipment changes in behavior and improved maintenance has the potential to save significant environmental and fiscal resources. The US Environmental Protection Agency estimates that through the installation of water efficient equipment and integration of water efficient practices into everyday operation, a 30% reduction in water consumption is possible. At state facilities, such a reduction could save taxpayers over \$4 million per year.<sup>21</sup>

Payback periods for implementing water demand reduction measures at institutional, industrial, and commercial facilities are generally low, between 1-4 years, with an average payback period of less than 2.5 years. There are also secondary cost benefits to conserving water, such as reductions in energy use to heat water and reductions in costs to treat and dispose of water. For example:



**Ipswich River**  
*The Ipswich River in northeastern Massachusetts ran dry during the summers of 1995, 1997, and 1999.*



**UMass Boston Water**  
*conservation measures and equipment at UMass Boston led to a 30% drop in usage from over 28 million gallons in 1999 to 20 million gallons in 2002, resulting in annual savings of \$140,000*



**Washing Machines**  
*The Chelsea Soldiers Home will save approximately 146,000 gallons of water and \$1,460 per year by installing four new water conserving clothes washing machines.*

- The EPA estimates that the institutional/commercial sectors in the U.S. could save 11 million kilowatt hours per day from reduced water consumption<sup>22</sup>
- The costs associated with chemical treatment for a cooling tower in a medium sized office building can range from \$5,000-\$10,000 a year<sup>23</sup>

Water conservation can also reduce capital costs to the extent that new infrastructure to meet future needs is deferred, eliminated, or reduced. By decreasing average system demand from over 300 million gallons per day (mgd) in the late 1980s to 250 mgd one decade later, MWRA deferred water supply expansion, and reduced the design capacity of its planned water treatment plant (now under construction) from 500 mgd to 405 mgd (peak water demand), resulting in savings of some \$36 million.<sup>24</sup>

More efficient water use and decreased demand is also important to protect the health of water bodies, wildlife, and habitats, particularly in stressed water basins in the Commonwealth where maintaining healthy in-stream flow is a challenge.

Introducing water conservation techniques and products during the planning and design for development or redevelopment projects will provide both environmental and economic benefit. Thus, the goals, targets, and actions identified in this subsection also are considered in the context of the Sustainable Design and Construction section. Stormwater runoff from development projects carrying elevated pollutant concentrations and loadings can infiltrate groundwater or spill into surface waters. Balancing the need for impervious surfaces with managing stormwater can prevent adverse effects on water sources, and is also addressed in the Environmental Compliance subsection of this report.

### III. Existing Water Conservation Efforts

Water demand in the MWRA service area increased steadily in the 60's, 70's, and 80's to a point where demand exceeded 300 mgd, the safe yield of MWRA's Quabbin and Wachusett Reservoirs. Rather than pursue options for increasing water supplies, the MWRA opted to implement a range of demand management strategies designed to reduce water use and water loss within its service area and prevent demand due to local source contamination. Today, MWRA system-wide demand is less than 250 mgd.

In 1992, the Massachusetts Water Resources Commission approved *Water Conservation Standards* for the Commonwealth. These standards focused on increasing water use efficiency by public water suppliers as well as improving water conservation efforts by end users, including home owners and institutions. In 2002 the Standards were amended to include a "Lawn and Landscaping Water Conservation" policy and guidelines.

**Quabbin Reservoir**  
*The Quabbin Reservoir is the world's largest man-made reservoir devoted to water supply, holding 412 billion gallons within its 39 square mile surface area.*



## Water Conservation Goal

*Reduce statewide government water use by at least 15% by 2010, based on 2003 baseline levels, by achieving more efficient water use, including improving employee behavioral practices, replacing inefficient fixtures, repairing leaks, reducing water used in landscaping and outdoor water use, and investigating reuse opportunities.*

### IV. Water Conservation Statewide Strategies

1. The Water Conservation Committee should provide information resources to agencies to help them identify, assess, and implement water conservation opportunities—such resources/tools include:
  - Website and web links;
  - Guides and fact sheets (e.g. Water Resources Commission's *Guide to Lawns and Landscape Water Conservation*);
  - Water conservation resources;
  - Periodic workshops and training;
  - Water audit checklist (s), guidelines, and benchmarks;
  - The Water Resources Commissions' *Water Conservation Standards* for the Commonwealth
2. The Water Conservation Committee should encourage manufacturers to provide water saving devices to state facilities for demonstration projects for reduced costs, and should seek to identify opportunities for collaborative demonstration projects.
3. OSD's EPP Purchasing Program should identify and offer water-efficient equipment and appliances on relevant state contracts, and should provide employee outreach to educate employees on all available water saving alternatives.
4. OSD's EPP Purchasing Program should incorporate WRC Guidelines for minimizing outdoor water use on relevant state service contracts.
5. DCAM and/or user agencies, should, where cost-effective, promote installation of water efficient appliances (e.g. dishwashers and clothes washing machines) in new or renovated state-owned buildings.
6. DCAM should review, and revise where necessary, its Instruction for Designers, to facilitate implementation of cost effective water use reduction measures.
7. DCAM should investigate the possibility of using the CAMIS database for tracking water usage and conservation efforts.

## V. Water Conservation Agency Strategies

*To help reach water conservation goals, agencies should:*

1. Use existing data (water/sewer bills, pumping records) to prepare a summary of the volume and cost of water being consumed and to spot trends, patterns, and unexplained increases that could indicate leaks or inefficient use of water.
2. Fix leaky state pools.
3. Work with the State Sustainability Program to set up green landscaping demonstration projects that incorporate water-efficient gardens with native and low-water-use plants, partner with local nurseries or landscapers to install green landscaping.
4. State Parks should distribute rain gauges to visitors to help them determine whether watering is really necessary on their own lawns - these containers should also be used in public areas to demonstrate their use.
5. Conduct water audits in large facilities or facilities with high outdoor water use - audits may be conducted by agency staff or by hiring a professional firm and should be used to identify measures where the greatest efficiencies and potential savings can be realized. Focus on water consuming equipment in buildings (e.g. bathrooms, boilers, chillers) and outdoor water use (e.g. lawns and landscaping, athletic fields, swimming pools, golf courses).
6. Follow the guidelines in WRC's *Guide to Lawn and Landscape Water Conservation* to reduce water consumption on lawns, landscapes, fields, and EOE's ecological landscaping tools guide—these documents are available on EOE's website at <http://www.state.ma.us/envir/mwrc/pdf/LawnGuide.pdf>.
7. Incorporate lawn and landscape design, maintenance, and construction guidelines for minimizing outdoor water use (WRC guidelines) in procurement bid documents/evaluation criteria.
8. Estimate cost and water savings for potential conservation measures, to prioritize projects' cost-effectiveness.
9. Replace plumbing fixtures that do not meet the Massachusetts flow standards with new plumbing fixtures, where economically feasible:
  - Toilets: 1.6 gallons per flush;
  - Urinals: 1.0 gallons per flush;
  - Lavatory faucets: .5 gallons hot water per minute, .25 gallons per use;
  - Shower Heads: 3.0 gallons per minute.

# Action Steps to Water Conservation

A variety of short-term actions state facilities can take to reduce their environmental impacts.

1. **Implement a water conservation awareness and outreach program:**
  - Solicit employee ideas through surveys or suggestion boxes;
  - Place bathroom stickers in restrooms encouraging water conservation;
  - Distribute brochures with water saving ideas;
  - Highlight water conservation measures for employees and the general public.
2. **Reduce non-essential water uses**, especially during periods of drought. Non-essential water uses include, but are not limited to: vehicle washing (unless necessary for operator safety), decorative fountains that do not recirculate water, routine watering of athletic fields not expected to receive play in the near future.
3. **Routinely inspect and repair any leaking water lines** as well as pumps and valves—provide a number to staff to report any identified leaks - a leaky faucet can waste up to 1,000 gallons of water per week and a 1/32" hole in a pipe wastes 6,300 gallons per week.
4. **Focus on restroom water use, which is often 30-50% of water demand at institutions:**
  - Replacing an old 3.5 gallons per flush (gpf) toilet with a new 1.6 gpf will save 494 gallons per male employee, and 1,482 gallons per female employee<sup>25</sup> each year;
  - Check system pressure and install pressure-reducing valves to reduce water consumption—a reduction in pressure from 100 to 50 PSI at an outlet can reduce water consumption by 33%;
  - Install water saving aerators on faucets and other plumbing fixtures. A low-flow faucet aerator can reduce flow by up to 1 gpm.
5. **As appliances wear out, replace with water saving models:**
  - High efficiency clothes washers use 30-50% less water and require 30-50% less energy to run<sup>26</sup>;
  - High efficiency dishwashers save about 3 gallons of water per load of dishes.
6. **Limit lawn watering to hours when evaporation is lowest**—early in the morning (before 6 a.m.) or later in the evening to maximize absorption and minimize evaporation. This can save as much as 30% of the watering demand<sup>27</sup>.
7. **For automatic irrigation systems, install system controllers** such as timers and rain sensors that prevent sprinkler systems from turning on during and immediately after rainfall, or soil moisture sensors that activate sprinklers only when soil moisture levels drop below pre-identified levels. Soil moisture sensors can reduce water consumption by as much as 40%<sup>28</sup>.
8. **Use soaker hoses for watering flower or shrub beds**, which allow water to soak out of the entire length of the hose and can use up to 70% less water than conventional irrigation systems and cost under \$10.00<sup>29</sup>.
9. **Plant drought tolerant native plants and grasses** in existing landscapes to reduce irrigation needs.
10. **Investigate the possibility of using reclaimed water** for irrigation and other approved uses.
11. **Eliminate once-through cooling** (possible locations are ice machines, refrigeration systems, air conditioners, compressors).



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## Program Area #6: Environmentally Preferable Purchasing

### I. Introduction and Background



According to the official definition in the Operational Services Division's Procurement Policies and Procedures Handbook, Environmentally Preferable Products (EPPs) "are products and services that have a lesser or reduced effect on human health and the environment when compared to competing products and services that serve the same purpose. Such products or services may include, but not be limited to, those which contain recycled content, minimize waste, conserve energy or water and reduce the amount of toxics either disposed of or consumed."

The overall goal of EPP procurement is to increase demand and develop markets for products that reduce, minimize, and even eliminate environmental and health impacts associated with the manufacture, use, and/or disposal of such products. In doing so, the intent is to promote increased production of EPPs, expand their availability, improve their performance, and reduce their cost. In recognition of the enormous purchasing power of all levels of government (equaling 20% of U.S. Gross National Product) governments across the country are now involved in the procurement of EPPs.

### II. Environmental and Economic Benefits

Purchasing EPPs can reduce the environmental and health impacts associated with products, ranging from conservation of natural resources, to reductions in energy consumption, to elimination of toxic materials such as mercury from the waste stream. These impacts directly and indirectly relate to the quality of life in Massachusetts. For example, by reducing the purchase of mercury-containing products such as thermostats or thermometers, less mercury ends up in landfills and incinerators, reducing the deposition of mercury in local fish and waterways. By purchasing recycled paper, trees are conserved, and less energy is needed to manufacture new paper—resulting in greater sequestration and reduced emissions of greenhouse gases, the leading contributor to climate change.

Buying EPPs can also result in direct economic savings as well as contribute to the local economy. Some EPPs actually cost less to purchase than their non-EPP counterparts (e.g. remanufactured toner cartridges), while others cost less to maintain or operate due to lower costs over the product's life (e.g. energy efficient office equipment), while others may reduce costs through avoidance of risk or reduced disposal costs (e.g. costs associated with mercury spills or disposal of mercury containing products). In Massachusetts, buying recycled products can create markets for materials collected through local recycling programs, thereby reducing the costs of those programs. Local companies that produce and sell EPPs generate revenue and jobs for the local economy.



**EPP Vendor Fair**  
*Over 100 suppliers and manufacturers of recycled and environmentally preferable products exhibited their products and services to well over 700 attendees at the 8th Annual EPP Vendor Fair and Conference on October 29, 2002, at Worcester's Centrum Centre.*

**Pool Ionization**  
*Installing new pool ionization equipment at the DCR Reilly Pool has reduced the use of chlorine by 50% and saved an estimated \$8000 over two years.*





**Toner Cartridges**  
*In FY2002, state agencies purchased 17,605 remanufactured toner cartridges saving over \$411,000.*

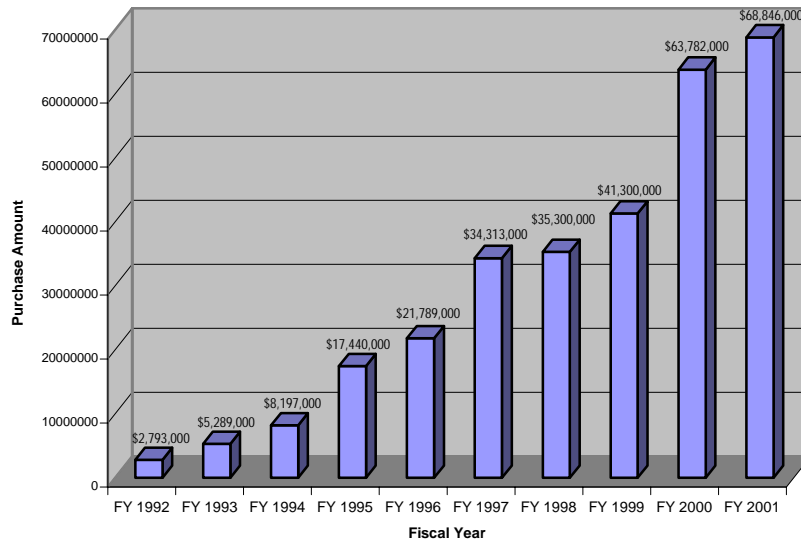
In a recent study conducted for OSD, EOE, and DEP, a consultant found that in one fiscal year alone, state government purchases of EPPs resulted in significant environmental and economic savings, including:

- Elimination of 4,063 metric tons of carbon
- Conservation of 60,846 trees
- Saving of 17,829 cubic yards of landfill space
- Cost savings to agencies of \$544,362
- Creation of 33 full-time jobs at 6 Massachusetts companies
- Generation of over \$11 million in revenues at 15 companies

### III. Existing EPP Efforts

The Commonwealth of Massachusetts, through the leadership of the Operational Services Division, has a nationally recognized EPP program. Purchases of EPPs by state agencies have increased steadily over the past decade, with recycled product purchases growing from \$42.8 million in FY1992 to over \$70 million FY2002. Purchases of other EPPs, such as energy efficient office equipment, less toxic cleaners, alternative fuel vehicles, and variety of environmental services now totals more than \$23 million annually.

Massachusetts Recycled Product Purchases FY 1992-2001



**Recycled Bridge**  
*As part of a Charles River park restoration project, the DCR and the City of Waltham used recycled plastic lumber to reconstruct a pedestrian bridge over the Charles River in Waltham, MA.*



Since 1994, environmental procurement staff at OSD have been working closely with EOE and DEP to develop a variety of tools and strategies to promote and increase purchases of EPPs. These include, but are not limited to: an annual vendor fair and conference; a detailed web site; fact sheets and guides to EPP statewide contracts; a pilot purchase program; and an annual awards program for agencies, municipalities, and businesses. Staff works closely with procurement management teams to conduct research and provide assistance with writing specifications to incorporate EPPs into statewide contracts when they are sufficiently available, perform well and are cost-effective. Currently, hundreds of EPPs are available on dozens of statewide contracts for purchase by agencies, authorities, and municipalities.

## Environmentally Preferable Purchasing (EPP) Goal

*Use the purchasing power of the Commonwealth agencies to cost-effectively reduce, minimize and/or eliminate the environmental and health impacts associated with the procurement, use and/or disposal of goods and services.*

### IV. EPP Statewide Strategies

1. OSD should continue to oversee the Environmentally Preferable Purchasing Program to reduce the environmental and health impacts associated with purchasing, reduce costs wherever possible, and increase operational efficiency. As part of such efforts, OSD should:
  - Increase the selection of EPPs on statewide contracts and eliminate non-EPP alternatives wherever feasible and cost-effective;
  - Improve agency access to EPPs on state contract by working with vendors to feature EPPs in stores, catalogs, and other promotional literature;
  - Identify EPP cost saving opportunities through product life-cycle cost assessments and alternative purchasing methods, such as cooperative and/or aggregate purchases;
  - Continue to acknowledge and reward EPP efforts among agencies and businesses;
  - Continue to track and report statewide EPP purchases;
  - Ensure the performance of EPPs through research, specification writing, and product testing;
  - Promote local economic development by marketing EPP sale opportunities to businesses.
2. OSD's EPP Purchasing Program should set annual targets for increased EPP purchases and communicate targets to agencies.
3. OSD's EPP Purchasing Program should continue and expand education and training efforts to promote and raise awareness of the availability and performance, the environmental and health benefits and cost saving opportunities associated with EPPs. Such efforts should include:
  - Conducting an annual vendor fair and exposition;
  - Offering periodic workshops;
  - Partnering with the Human Resources Division to incorporate EPP information into statewide training sessions;
  - Promoting EPPs to non-executive agencies, including authorities, municipalities, and schools;
  - Collaborating with other regional and national environmental initiatives to increase demand, strengthen markets, and reduce costs of EPPs.
4. OSD's EPP Purchasing Program should develop and provide a range of tools for agencies to help identify, assess, and procure EPPs wherever possible. Such tools could include:
  - Website and on-line training tools;
  - Guides, fact sheets, electronic newsletters;
  - On-line environmental analysis calculator;
  - Cost-effectiveness comparisons and case studies;
  - EPP product and service contract language and tracking guidance.

## V. EPP Agency Strategies

*To help reach environmentally preferable purchasing goals, agencies should:*

1. Purchase EPPs whenever they are equal in performance and cost-effective based on the product's life-cycle cost, which includes the purchase, operating, and disposal costs associated with purchases made through statewide contracts, agency RFRs, incidental, and credit card purchases.
2. Purchase and evaluate new EPPs periodically and/or participate in EPP testing opportunities.
3. Identify the most significant purchases made on an annual basis and take steps to ensure that the products contain EPP criteria wherever possible and effective.
4. Based on language developed by the OSD EPP Purchasing Program, incorporate EPP specifications into service contracts and grants over \$50,000.
5. Designate one person to stay abreast of EPP issues, receive ongoing information, such as the EPP newsletter and disseminate such information to appropriate agency personnel.
6. Participate in the annual EPP conference, other related workshops and training, and appropriate awards and recognition programs.

# Action Steps to Environmentally Preferable Purchasing

A variety of short-term actions state facilities can take to reduce their environmental impacts.

1. **Save money by purchasing EPP products that cost less, including, but not limited to:**
  - Remanufactured toner cartridges;
  - Remanufactured office panels;
  - Retread tires;
  - Recycled mulch;
  - Recycled antifreeze;
  - Recycled plastic traffic cones.
2. **Conserve energy and reduce electricity costs by purchasing energy efficient office equipment, appliances, lighting fixtures, LED exit signs, and other items.**
3. **Purchase durable products that do not have to be replaced often, such as plastic lumber furniture, planters, and other recycled plastic outdoor products. Reduced maintenance and replacement costs over the product's life often offset any additional purchasing costs.**
4. **Reduce potential liability, health risks, and clean-up costs, by purchasing less or non-toxic products. Examples include:**
  - Bio-based lubricants, especially for landscaping equipment near sensitive areas where oil leaks could be substantially damaging (e.g. golf courses, wells, rivers and streams, etc.);
  - Mercury-free thermometers, barometers, thermostats, and blood pressure cuffs. Disposal of mercury products can be costly and clean up of a single mercury thermometer break can run into thousands of dollars;
  - Ionization systems for water treatment in swimming pools that reduce the use, handling, and storage of toxic chemicals.
5. **Consider leasing expensive equipment (e.g. large copiers, computers) to avoid up-front costs, incorporate ongoing maintenance and upgrades, and eliminate disposal costs.**
6. **Purchase reconditioned equipment from state contracts for fitness equipment, hospital equipment, vehicle parts, etc. These products are almost always less costly than new and frequently just as good.**
7. **Ask all bidders to submit proposals on recycled paper, double sided copies, and without extra materials not requested. This helps to promote recycled paper markets, reduce vendor mailing costs and minimize agency file storage needs.**
8. **Use bulk purchasing of EPPS to reduce product costs. For example, recycled copy paper costs decrease as much as 27% when you purchase 6 cases instead of 5.**
9. **Maximize the productivity and comfort of staff, visitors and clients by purchasing products that improve indoor air quality. Buy less toxic cleaners, carpeting and paints with low volatile organic compounds (VOCs), and use integrated pest management strategies to minimize pesticide application.**
10. **Use statewide contracts whenever possible to identify and purchase EPPs. Products on statewide contract have been evaluated and often tested for performance, quality control, vendor performance, as well as for specific environmental criteria. Use statewide service contracts to promote sustainable practices, such as environmental landscaping and the recycling of various hazardous and hard-to-manage materials (see next page for a comprehensive list).**

## EPP Statewide Contracts

PRODUCTS	Contract #	PRODUCTS	Contract #
Anti-freeze, Recycled	VEH18A	Plastic Lumber – <i>tables, benches, traffic control, dimensional lumber, planters, etc.</i>	FAC20
Appliances, General & Air Conditioners, Energy Efficient	FAC12	PRIME GROCER- <i>recycled content paper plates &amp; trays, paper towels, toilet tissue, napkins, plastic trash bags, disposable wipes</i>	GRO14
Bio-Based Lubricants	VEH18A	Promotional Items, Recycled	OSC01
Boxes, Recycled Corrugated	OFF12	Safety Vests, Recycled Plastic	CLT04
Building Materials & Supplies (selected items)	FAC02	Tires, Retread	VEH21
Carpet and Flooring Products & Services – <i>also incl. rubber matting and vinyl flooring</i>	FAC25	Toner Cartridges, Laser Printer, Remanufactured	OFF06
Cleaning Products, Environmentally Preferable	GRO16	Traffic Cones and Safety Products, Recycled	VEH49
Compost Bins	FAC16	Trash bags, Plastic, Imprinted	DEP 99-2000-4
Compost and Mulch, Recycled	FAC19	Vehicles, Electric (Zero Emission)	VEH08 – expired
Containers and Carts, Recycling Set Out	EQE-RSCIIRC	Vehicles, Hybrid	VEH34
Electrical & Lighting Supplies & Equipment	FAC22	Vehicle Parts, Motorized Accessories	VEH11A
Express Delivery Services	OFF11	Water Treatment / Pool Ionization	FAC17
Fitness Equipment, Reconditioned	OFF14	<b>SERVICES</b>	
Foodservice Equipment, Efficient	GROC7	Asbestos and Lead Paint Abatement Services	ST1J211
Glass Beads, Recycled	VEH-39	Cathode Ray Tube (CRT) Recycling	ST0J211
Hospital Supplies, Remanufactured & Used	HSP18	Environmental and Maintenance Diagnostic Testing Services	ST8H141
Industrial / Commercial Supplies	FAC28	Fluorescent Lamp & Ballast & Computer Recycling	FAC26
Motor Oil, Re-Refined, Antifreeze, and Other Lubricants	VEH18A	Hazardous Material Collection Services – <i>including hazardous waste collection events and medical waste collection</i>	ST9J213A
Office Furnishings, Remanufactured	OFF03	Paint Collection	ST9J212
Office Supplies, Recycled	OFF01	Integrated Pest Management (IPM)	ST8J181
Offset Printing, General	OFF15	Scrap Tire Disposal Services	ST0J39S
PAPER - <i>copier, laser, rag bond, cut/flat stock, computer, forms, envelopes</i>	OFF05	Solid Waste and Recycling Services	ST1J391
PCs and Peripherals	ITC05	Surplus Office Disposal Services	SSP02
Photocopier Equipment and Supplies	OFF02		

*Contract numbers are current as of 08/01/03 but may change in the future.*

*Please visit the Operational Services Division, Environmentally Preferable Purchasing Program website for updated and detailed contract information at <http://www.mass.gov/osd/enviro>.*



## Program Area #7: Environmental Compliance

### I. Introduction and Background

In Massachusetts, there are a wide variety of local, state and federal regulations that help to protect human health and the environment. Maintaining compliance with these regulations is the minimum starting point for any sustainability program.

Many state facilities must be aware of and in compliance with regulations that address hazardous waste storage, management and disposal, testing and monitoring of septic and underground storage tanks, and protection of wetlands and surface waters from stormwater discharge, to name just a few.

Through proper maintenance, due diligence, and environmental planning agencies can proactively meet these and other regulations. Facilities interested in establishing comprehensive compliance practices may want to consider:

- Conducting extensive facility audits and monitoring at large facilities, or simple periodic inspections at smaller entities
- Designating one or more staff to be responsible for managing compliance issues, with very clearly defined roles and responsibilities;
- Developing formal protocols and policies on managing compliance issues and responding to emergency situations swiftly;
- Establishing an auditing and monitoring system, through either internal or external resources, and clear-cut procedures for reporting all violations to the appropriate entities; and
- Implementing a process to periodically review, alter and improve compliance practices.

### II. Environmental and Economic Benefits

From protecting drinking water resources, to minimizing exposure to potentially toxic chemicals, achieving and maintaining compliance with environmental laws and regulations has clear-cut environmental and health benefits. In addition, maintaining compliance has significant economic benefits, particularly in relation to avoiding potential costs associated with violations.

Public and private facilities that fail to be vigilant about compliance matters can often face significant costs associated with remediating a spill or other compliance matters. For example, during the 1990s, one state agency spent over one million dollars in remediation costs to clean up contamination from leaking underground storage tanks, significantly more than the cost of regular monitoring and maintenance.

Additionally, entities that are inspected by state and federal regulatory agencies can be liable for significant fines when violations are discovered. The U.S. Environmental Protection Agency (EPA) reported nationwide fines and supplemental project assessments totaling \$334 million in 2001, while requiring polluters to invest \$4.3 billion in pollution control and cleanup.



#### Good Management Practices

*Proper storage and handling of hazardous waste protects worker health and helps prevent releases of hazardous materials into the environment, thereby avoiding fines and penalties and eliminating the high cost of clean-up and remediation.*

#### Storage Tanks

*Approximately 650 underground storage tanks at state facilities, containing more than two million gallons of gasoline and oil, have been replaced or upgraded, minimizing the risk of water and soil contamination.*





**Chemical Storage**  
*In 2003, the EPA proposed fining a Massachusetts state college \$358,000 for improper chemical storage and handling practices.*

**Septic Systems**  
*More than 100 septic systems at state parks, highway rest areas, and institutions have been repaired or replaced, eliminating approximately one million gallons of water pollution per day, such as these composting toilets at the Nashoba River Rail Trail.*



Some agencies have addressed compliance matters through reduction or elimination of toxic substances altogether, completely avoiding hazardous waste management and disposal costs and eliminating the potential for financial penalties from regulatory agencies. For example, salt, grease, oil, and other typical vehicle washing residues presented an ongoing compliance violation for several agencies due to runoff that negatively affected groundwater and surface waters. By installing washwater-recycling stations in several facilities, one agency eliminated the compliance issue, saved thousands of gallons of water annually, and saved approximately \$20,000 per facility per year in contaminated water disposal costs.

### III. Existing Compliance Efforts

Under the direction of the Massachusetts Clean State Initiative, established in 1993, Commonwealth agencies invested over \$250 million to address over 4,000 violations at state facilities, ranging from asbestos and lead paint abatement to repair and removal of underground storage tanks. Additionally, work over the past ten years on compliance issues has resulted in a dramatically improved compliance record and an increased understanding and awareness at state agencies of the environmental benefits associated with, and the importance of, maintaining a vigilant compliance effort.

The benefits of investing in appropriate compliance measures translate directly to the protection of human health, wildlife, and the environment. By upgrading or replacing state-owned underground storage tanks, an estimated six million gallons of petroleum products no longer threaten ground and surface water resources. In addition, agencies upgraded or removed 100 outdated septic systems. Incinerators in urban communities, such as Roxbury and Jamaica Plain, were closed and one in Chelsea was upgraded with state of the art emission controls. Soil contaminated with lead paint was removed from state-owned playgrounds, recreational facilities, and day care centers, and many tons of asbestos were removed from rinks, pools, and veterans' homes.

Currently, a number of agencies have gone even further by establishing formal processes and procedures to maintain compliance and ensure that violations are discovered and reported immediately. MassHighway, the University of Massachusetts-Lowell Olney Science Building, the Department of Environmental Protection Wall Experiment Station, and the Massachusetts Correctional Institution, Norfolk have developed comprehensive Environmental Management Systems (EMS) that address the need for compliance processes at the agency. The State Sustainability Coordinating Council and Compliance Committee are developing guidance and tools that will encourage and assist all agencies in the establishment of self-auditing, monitoring and reporting procedures.

## Environmental Compliance Goal

*To ensure that all state owned and operated facilities are in compliance with all federal, state and local regulations at all times, and that proper processes and procedures are in place at appropriate facilities to ensure ongoing compliance.*

### IV. Environmental Compliance Statewide Strategies

1. The Compliance Committee should evaluate existing management tools and promote the use of appropriate tools to establish agency systems that address compliance issues effectively and efficiently.
2. The Compliance Committee should continue to review and collect relevant sources of information on new regulations and policies that may be useful to agencies including, but are not limited to:
  - Existing and new statewide contracts;
  - Newly promulgated environmental regulation and policies;
  - Appropriate newsletters and websites;
  - Massachusetts Licensed Site Professionals Association (LSPA) materials and website;
  - The Compliance Committee should work with EOEA to distribute this information.
3. The Compliance Committee should promote agency training opportunities, including:
  - Publicizing available training information sponsored by other entities;
  - Sponsoring training for Commonwealth agencies.
4. The Compliance Committee should investigate and promote funding opportunities to help maintain compliance.
5. The Compliance Committee should promote the use of Environmental Management Systems as a way to regularly identify new regulations and monitor compliance status and pollution prevention
6. The Department of Environmental Protection (DEP) should work with the Compliance Committee to develop a series of compliance tools, including:
  - A self-audit checklist that agencies can use to conduct facility audits, identify matters that need to be addressed, report to the appropriate entity, and next steps for remediating identified matters;
  - Procedures for regulatory reporting (federal, state, and local) including timeframes, contacts, and required information.
7. DEP should work with the Compliance Committee to develop and promulgate a new self-audit policy that provides mitigation incentives for agency reporting of compliance matters to the Clean State database.
8. DEP, EOEA, and the Compliance Committee should review and restructure the existing *Clean State* database to allow users to track beyond compliance environmental issues.

## V. Environmental Compliance Agency Strategies

*To help reach environmental compliance goals, agencies should:*

1. Use the Clean State database to provide an easy, cost-effective means of monitoring compliance, and report to database quarterly.
2. Review the results of previous environmental audits (including *Clean State* audits) and determine whether recommended actions have been implemented and whether new audits are warranted.
3. Develop processes that help achieve and maintain compliance. This includes a review of the agency's current operations and applicable regulations, and the development/ implementation of a Management System as outlined in EO No.438 that clearly identifies roles and responsibilities (see Section 3 of the Guide for more information).
4. Designate key individuals who will familiarize themselves with environmental regulations applicable to the agency and be responsible for coordinating compliance efforts.
5. Develop a Communication Plan to educate employees on compliance efforts, activities and information, and ensure that appropriate staff have access to education and training necessary to understand and implement environmental compliance measures.
6. Share information and best practices among agencies and agency facilities to ensure consistency of compliance procedures and reduce staff time necessary to develop such procedures.
7. Develop best management practices in collaboration with agency field staff, and post practices in visible locations.

# Action Steps to Environmental Compliance

A variety of short-term actions state facilities can take to reduce their environmental impacts.

1. **Be familiar with and follow hazardous materials storage, handling, and spill cleanup procedures:**
  - Hazardous Waste - 310 CMR 30.000;
  - Tanks and Containers - 527 CMR 9.00;
  - MA Contingency Plan - 310 CMR 40.0000.
2. **Know your rights.** You have a right to work in a safe and healthy environment. The Massachusetts Right to Know Law, MGL 111F [www.state.ma.us/legis/laws/mgl/gl-111F-toc.htm](http://www.state.ma.us/legis/laws/mgl/gl-111F-toc.htm) required three agencies to publish regulations to protect worker health:
  - Division of Occupational Safety (DOS) - Workplace Regulation - 454 CMR 21.00 [www.state.ma.us/dos/pages/RTK.htm](http://www.state.ma.us/dos/pages/RTK.htm);
  - Dept of Public Health (105 CMR 670.000) Mass Substance List and Lab exemptions [www.state.ma.us/legis/laws/mgl/111f%2D4.htm](http://www.state.ma.us/legis/laws/mgl/111f%2D4.htm);
  - Dept of Environmental Protection (310 CMR 33.00) Community Right to Know [www.state.ma.us/dep/dephome.htm](http://www.state.ma.us/dep/dephome.htm).
3. **Inventory all the chemical products in your facility or area of work and evaluate them for their relative hazard by using the *Massachusetts Substance List* MGL Ch. 111F <http://www.state.ma.us/legis/laws/mgl/111F-4.htm>.**
  - Create a list of chemicals considered hazardous found in your facility;
  - Evaluate opportunities to substitute less hazardous alternatives.
4. **Know your hazardous waste storage capacity.**
  - Ensure that your facility has an up-to-date Hazardous Waste Generator ID Number and that you are working within the assigned storage limits;
  - Notify your supervisor when those limits are nearing capacity.
5. **Separate and properly store incompatible materials and segregate wastes from virgin products**
  - Establish and maintain hazardous waste accumulation areas;
  - Ensure appropriate signage is visible.
6. **Check your area periodically** to ensure that hazardous materials containers are properly closed and stored and that appropriate labeling is intact.
  - Create a checklist for periodic inspections and maintain the records in a central location.
7. **Practice good record keeping:**
  - Keep current Material Safety Data Sheets (MSDS) for every product you use;
  - Ensure waste disposal manifests are up to date and centrally located;
  - Keep a central location for all reporting, inventory, and MSDS documentation.
8. **Post emergency information** such as phone numbers for your agency emergency contacts, fire, police, DEP, and hospital and diagrams of emergency escape routes.
9. **Be familiar with and follow established health and safety procedures**, and ensure that on-site contractors do so as well.
  - Post your agency EH&S policy or statement in a conspicuous location and refer new employees, contractors, and visitors to that local.
10. **Conduct periodic meetings** with appropriate agency staff to review and improve compliance procedures.
  - Ensure all staff have adequate training - many Statewide EH&S contracts offer value-added free training.
11. **Immediately notify** your agency emergency contact in the event of a spill or an emergency.

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## Program Area #8: Natural Resource Protection

### I. Introduction and Background

The Commonwealth has a great richness of natural resources, including water and land resources, and the species they support. Water resources include both salt and fresh water wetlands, lakes and ponds, rivers, estuaries, and coastal waters. Our upland resources include forests, meadows, agricultural lands, and mountains. The many distinct ecosystems and habitat types within the thirteen Massachusetts ecoregions provide critical habitat for rare and endangered species, as well as common Massachusetts plants and animals. Together, these lands and the species they support constitute our Natural Heritage and can be broadly defined as biodiversity.

The Commonwealth's natural resources face many threats. According to the internationally recognized and renowned scientist E.O. Wilson, the five greatest threats to our Natural Heritage and biodiversity can be represented by the acronym HIPPO:

- **Habitat Loss:** According to a recent study by the Massachusetts Audubon Society, the state currently loses 44 acres a day to development.<sup>30</sup>
- **Invasive Species:** Species not originally native to Massachusetts that are now displacing, destroying, or out-competing native species are cited as the second most critical threat to biodiversity—over 50% of our lakes are infested with invasives.<sup>31</sup>
- **Pollution:** Over 1,000 Massachusetts water bodies are listed as not meeting Massachusetts' water quality standards. The major cause of water pollution in the Commonwealth's rivers and lakes is stormwater runoff.<sup>32</sup>
- **Population:** Since 1950 the population of Massachusetts increased by only 28%. In that same period, the amount of developed land increased by 188%;<sup>33</sup>
- **Over harvesting:** Resources impacted by over harvesting include marine fish and shellfish, some freshwater fisheries.

State agencies manage over 500,000 acres, or roughly ten percent of the Commonwealth's 5 million acres. These lands include 245 state parks, reservations, and wildlife management areas, 77 beaches (fresh and saltwater), and 6 reservoirs. In addition, numerous state agencies own and manage land associated with state facilities including state prisons, schools, and hospitals.

As large and small landholders, these state agencies play a significant role in the protection, management, and restoration of Massachusetts' natural resources for all citizens of the Commonwealth. Implementing long term, environmentally sustainable practices will help to ensure that future generations can enjoy clean water, open space, a variety of recreational opportunities, and a high quality of life.

### II. Environmental and Economic Benefits

Healthy ecosystems provide the foundation for our quality of life. In fact, properly-functioning ecosystems result in clean water and avoided costs associated with water treatment; clean air and its associated health benefits; unpolluted soils and their valuable nutrient cycling functions; and flourishing and diverse fish and wildlife populations.

Massachusetts has several natural resource-dependent industries which are important contributors to the state's economy:



#### Biological Diversity

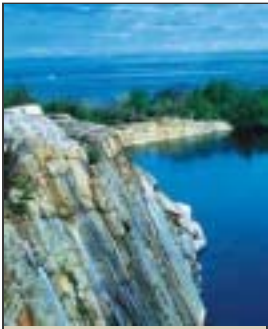
*Massachusetts has a rich biological legacy and is home to a wide array of plants and animals, including globally rare communities like the Sandplain Heathlands of Cape Cod and the Islands.*

#### Ecological Landscaping

*Planting native species in a landscape can often reduce maintenance costs and effort, as native species generally require less water and fertilizer than non-native species.*







**Tourism in MA**  
*It is estimated that \$10 billion of Massachusetts' tourism dollars are linked to outdoor recreational activities. Fishing and hunting contribute \$630 million and wildlife watching adds another \$600 million per year to the state's economy.*

**Native Species**  
*Species of plant and turf native to the eastern United States have adapted to the region's climate and pests, often require less fertilizer, pesticides, and water, and support more native wildlife than non-native species.*



- **Tourism:** The state's third largest industry, with more than \$21 billion per year in direct and indirect revenues (of the total \$258 billion annual economy in Massachusetts) from 29 million domestic and international visits per year. Tourism contributes \$791 million annually in state and local taxes.<sup>34</sup>
- **Forestry:** It is estimated that each acre of forest in Massachusetts provides \$1,500 in economic value per year (including forest products, water filtration, flood control, tourism, etc.). For the state's 3.1 million acres, that totals \$4.6 billion per year.<sup>35</sup>
- **Agriculture:** Massachusetts' 6,000 farms make up 570,000 acres or 10% of the state. Although it is the eighth smallest state, Massachusetts ranks seventh in direct sales of agricultural products.<sup>36</sup>
- **Open Space:** Open space enhances nearby property values and generates more revenue than it demands in services. A recent nationwide study of the impact of open space on property value found increases of 6% in rural areas and 40-50% in urban areas, for property up to ½ mile away from significant open spaces.<sup>37</sup>

At the state agency level, natural resource protection measures can have positive budgetary effects. For example, green landscaping and IPM measures can often directly reduce costs at a facility, through reduced use of water, pesticides, and fertilizers.

### III. Existing Efforts

The Commonwealth is recognized as a national leader in watershed and ecosystem management, and the citizens of Massachusetts are national leaders in the movement to promote biodiversity. State agencies currently lead and participate in numerous activities to protect our resources, and many of these are joint ventures with universities, non-profit groups, and other states and provinces. Some examples include

- **Biodiversity:** EOEa and NHESP have completed the Statewide Biomap and Aquatic Biodiversity Projects, which provide critical guides for efforts to protect biodiversity.
- **Invasive Species:** Massachusetts is one of only eight states to receive approval of and funding for an Aquatic Invasive Species Management Plan by the Federal Task Force on Aquatic Nuisance Species.
- **Innovative Stormwater Management:** EOEa, DCR, and DEP have funded numerous grant projects to demonstrate innovative stormwater management techniques that protect and improve water quality for new and existing developments. For project summaries visit: <http://www.state.ma.us/dep/brp/stormwtr/stormhom.htm>.
- **Innovative Wastewater Management:** DCR and MassHighway are demonstrating innovative wastewater technologies at state parks and turnpike rest areas through use of composting toilets that use no water and protect water quality.
- **Land Preservation:** EOEa has preserved over 650,000 acres of land as open space and is working to preserve an additional 2 million acres by 2023, including land at state facilities.

## Natural Resources Protection Goal

*To protect and sustain local and regional biodiversity, maintain and restore the ecological integrity of state lands and waterways, and preserve open space through the application of ecologically sound land management practices.*

### IV. Natural Resources Protection Statewide Strategies

1. The Natural Resources Committee should work with land protection agencies to develop a green space protection policy for projects on state land.
2. The Natural Resources Committee should compile Best Management Practices (BMPs) for ecologically sound land management.
3. The Department of Conservation and Recreation (DCR) should obtain and maintain third-party certification to ensure that all working state forests are managed sustainably, and
4. Formalize an inter-agency task force with representatives from EOEa, DCR, and DFG, along with private and non-profit landholders to oversee efforts to promote certification of private forests.
5. OSD's EPP Purchasing Program should ensure that statewide contracts for landscape management include contractors who are familiar with green landscaping practices such as:
  - Native species planting (planting of invasives should be prohibited);
  - Water-saving irrigation techniques;
  - Integrated Pest Management (IPM) practices.
6. OSD's EPP Purchasing Program should make available on statewide contracts third party certified wood, and wherever possible, encourage state contractors to offer foods grown in a sustainable manner such as organic farming, Integrated Pest Management (IPM) or other sustainable methods.
7. The Department of Agricultural Resources (DAR) should notify all state facility managers of their *Guide to Environmentally Sound Lawncare*, and the *Integrated Pest Management Kit for Building Managers*, which can be downloaded at <http://www.state.ma.us/dfa/pesticides/publications/index.htm>.
8. The Division of Capital Asset Management (DCAM) should ensure that new state agency developments and retrofits include Low Impact Development (LID) practices which provide for stormwater runoff to be returned to the ground as close to where it had originally fallen as rain - see the LID website <http://www.lowimpactdevelopment.org/>.
9. DEP's Innovative Technology Program should identify and publicize to state agencies appropriate innovative wastewater management systems that compost waste and minimize water use.
10. EOEa Invasive Plant Working Group should compile and distribute to all state agencies a list of contacts for rapid response to new infestations of invasive species.

## V. Natural Resources Protection Agency Strategies

*To help reach natural resource protection goals, agencies should:*

1. Develop/update facility stormwater management plans. Plans should meet all state and federal guidelines and should use new and innovative technologies whenever possible. For additional information contact the DEP.
2. Consider preserving appropriate unused state-owned open space - contact the EOEALand Acquisition group at 617-626-1170 to discuss the potential to preserve this land through legislation.
3. Follow Integrated Pest Management (IPM) guidelines <http://www.umass.edu/umext/ipm/> for state-owned and operated lawns and landscapes - IPM involves the use of ecologically based, common sense methods to maintain a healthy lawn.
4. Use native and drought tolerant plants in all landscapes - for specific information on which plants to use, consult the guide, *Native Alternatives for Invasive Ornamental Plant Species*, available online at [http://www.mnla.com/OLGImages/Site0069/invasive\\_alternatives.pdf/](http://www.mnla.com/OLGImages/Site0069/invasive_alternatives.pdf/).
5. Avoid the use of invasive plant species in all landscapes - do not plant any of the 37 plants listed on the *Evaluation of Non-Native Plant Species for Invasiveness in Massachusetts*, available at [http://www.mnla.com/OLGImages/Site0069/evaluation\\_for\\_invasiveness.pdf/](http://www.mnla.com/OLGImages/Site0069/evaluation_for_invasiveness.pdf/) by the Massachusetts Invasive Plant Working Group, March 2003.
6. State agencies conducting lawn care should consult and follow recommendations in EOEAL's *Guide to Lawn and Landscape Water Conservation*, May 2002, available on the EOEAL website at <http://www.state.ma.us/envir/mwrc/pdf/LawnGuide.pdf/>.
7. When planning landscapes and grounds at newly developed or redeveloped sites, agencies should conduct a landscape audit to:
  - Identify areas where water that is currently running offsite could be captured on-site and returned to the ground (via rain gardens, rainbarrels, vegetated swales);
  - Identify invasive plants and develop a plan to replace with natives that are drought-tolerant and therefore lower maintenance, lower cost, and protective of natural resources;
  - Identify places where paved surfaces and lawn could be reduced, and/or replaced with vegetation to capture rainwater and allow it to soak into the ground and restore the water table, and to filter runoff;
  - Look for opportunities to improve soils through compost, to reduce need for fertilizers and increase soil moisture-holding capacity.

# Action Steps to Natural Resource Protection

A variety of short-term actions state facilities can take to reduce their environmental impacts.

1. **When designing or renovating a facility with green space, make sure to:**
  - Minimize lawn size and amount of turf;
  - Plant native shrubs, trees and wildflowers that require less water and save on maintenance costs.
2. **Maintain lawns efficiently by:**
  - Mowing grass at a 3-inch minimum height -- keeping grass longer will allow it to develop a larger root system that requires less water to stay healthy;
  - Leave grass clippings on the grass -- in just 2 weeks time, nitrogen from the clippings is integrated into the soil;
  - For more information on lawn care read DEP's "Don't Trash the Grass" fact sheet at: <http://www.state.ma.us/dep/recycle/files/dtg.doc/>
3. **Use fertilizers only when necessary, and where possible use natural, biologically derived, organic fertilizers, or phosphorus-free fertilizers.**
  - Have soils tested before you use fertilizer to determine need. Visit the UMass Extension Program at <http://www.umass.edu/plsoils/soiltest/> or call (413) 545-2311 for information on free soils testing;
  - MWRA biosolids fertilizer (treated, pelletized sludge) is available AT REDUCED OR NO COST to state agencies. Using biosolids fertilizers may eliminate the need to purchase additional fertilizer, and reduces the leaching of nitrogen into groundwater. Contact the MWRA at 617-539-3682 for additional information.
4. **Use recycled mulches to reduce weed growth, slow erosion, retain water, and build soil texture. Recycled mulches in a variety of colors and textures can be purchased from statewide contract #FAC19 for Farm, Lawn, Garden and Outdoor Application Products.**
5. **Compost all lawn and yard waste, either on-site or at local collection areas. Diverting organics from the solid waste stream can have significant cost-savings, particularly if you use yard clippings or finished compost on-site.**
  - Contact your local Starbucks for information on free coffee grounds to use in composting for vermi-composting.
6. **Use compost on landscapes to add nutrients to soil as a supplement to fertilizer, instead of additional topsoil.**
  - Compost can be purchased from statewide contract #FAC19 for Farm, Lawn, Garden and Outdoor Application Products.
7. **Minimize tree and vegetation clearing during site work, facility renovation, or new construction.**
8. **Use loose, porous material if you need to pave surfaces in landscaped areas to allow for proper drainage**
  - Material such as flagstones, gravel, crushed shells, and mosaics of reused concrete slabs are appropriate, and recycling previously used material helps to "close the loop".<sup>38</sup>
9. **Install rainbarrels on downspouts and gutters to capture clean roof runoff, which can be used to water lawns and gardens.**
10. **Visit the UMass Extension program website at <http://www.umassextension.org/> to obtain guidance and information on training opportunities (no or low cost) on forest management, IPM, and other green landscaping practices.**

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## Section 3: Agency Sustainability Planning

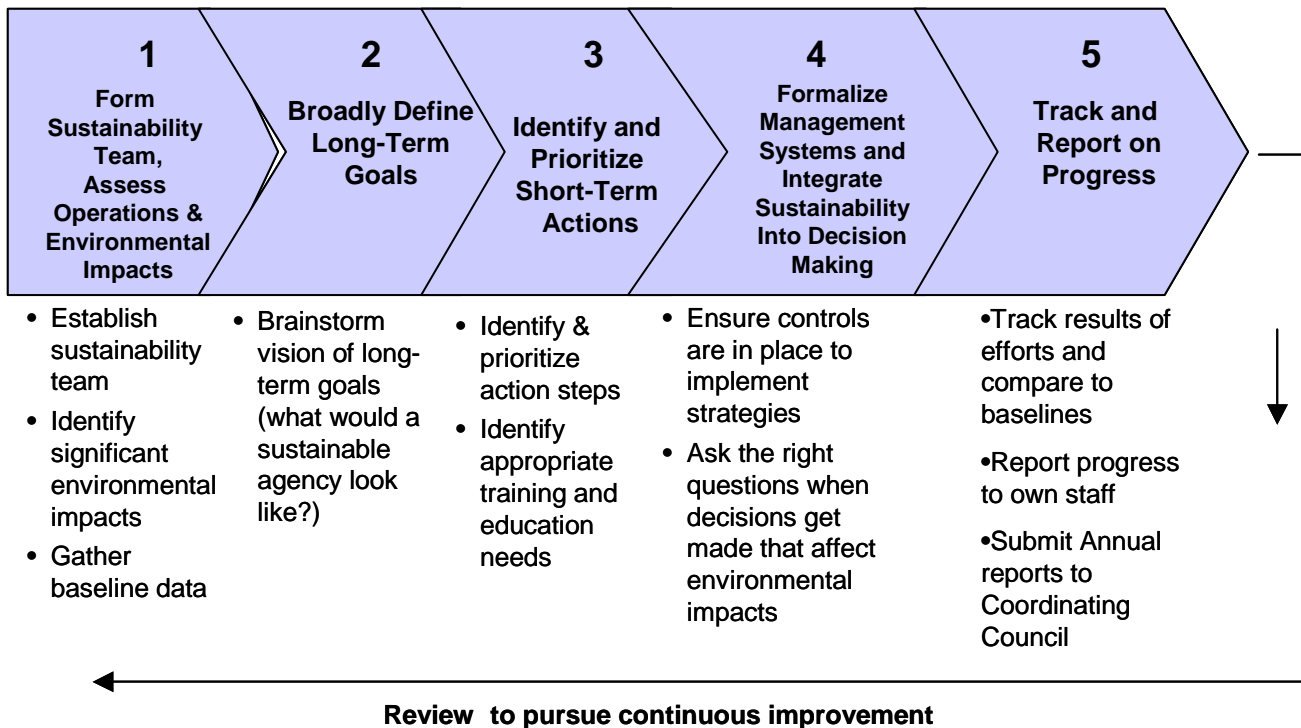
Executive Order No. 438 requires all state agencies to complete a written Agency Sustainability Plan that outlines the agency's environmental impacts, makes recommendations for reducing these impacts, and establishes short term objectives and a long range vision of sustainability for the agency. Section 3 of the Guide - Agency Sustainability Planning - provides general guidelines on planning for sustainability, as well as a specific 'Template' for agencies to use when writing their Agency Sustainability Plans.

Planning requirements of Executive Order No. 438
Executive Order No. 438 contains <b>specific agency requirements</b> such as: <ul style="list-style-type: none"><li>→ Appoint State Sustainability Coordinators</li><li>→ Initiate processes to review internal operations, identify environmental impacts, make recommendations for reducing said impacts</li><li>→ Track and report to the Council annually</li><li>→ <b>Write an Agency Sustainability Plan</b> by October 8, 2004 that reviews all internal operations and establishes a system to address environmental impacts. Such plans must be submitted to the State Sustainability Coordinating Council and updated at least annually.</li></ul>
<b>The State Sustainability Council</b> established by the Executive Order must: <ul style="list-style-type: none"><li>→ Complete a Sustainability Implementation Guide</li><li>→ Submit to the Governor an annual Statewide Sustainability Report by December of each year</li></ul>

This Section is organized as a 5-step Road Map, which is designed to be a simple, efficient process that can be applied to the wide range of agency operations within the Commonwealth. The aim is for each agency to review its internal operations and identify ways to minimize environmental impacts that are appropriate for its operations and agency goals. It is important that agencies spend at least some time going over each step in the Road Map, and answering all relevant questions, during the planning process. The 5-step Road Map includes the following actions:

1. Establish a Sustainability Team, and Assess Operations and Environmental Impacts
2. Broadly Define Long-Term Goals
3. Identify and Prioritize Short-Term Actions
4. Formalize Management Systems and Integrate Sustainability Into Decision-Making
5. Track and Report on Progress

## Sustainability Planning Road Map



### Agency Sustainability Plans

The questions and discussions facilitated by the 5-step Road Map closely follow the format of the *Agency Sustainability Plan* "Template," which was developed by the Council as guidance for agencies when writing their Sustainability Plans. A copy of the Template is included in Appendix 3 of the Guide.

The deadline for submission of *Agency Sustainability Plans* to the State Sustainability Council is October 8, 2004. Below is a suggested timeline for agencies to follow, to ensure they have adequate time to develop and write their Plan.

Suggested Deadline	Plan Development Step
May 21, 2004	Establish Sustainability Team and hold initial meeting
June 1, 2004	Follow 5-steps outlined in Road Map, including development of a sustainability workplan
July 31, 2004	Submit initial draft of Sustainability Plan to Council for preliminary review, if helpful
September 15, 2004	Submit next draft to Commissioner/Director or other appropriate staff for review
October 8, 2004	Submit final Sustainability Plan to Council
Annually	Submit Tracking and Reporting Form to Council
Annually	Review and amend, where necessary, Agency Sustainability Plan

Please note that agencies should still be working during this timeframe to implement sustainable practices, even while the final Agency Sustainability Plan is being developed.



## **Road Map Step 1 ➡ Form Sustainability Team & Assess Operations and Environmental Impacts**

### **A. Create a Sustainability Team**

Before taking concrete steps to develop agency-wide sustainability actions, agencies should establish a Sustainability Team (Team). A Team that includes employees most familiar with major agency operations can provide an effective means of identifying sustainable actions the agency may want to pursue, developing a strategy to implement such actions, and effectively communicating sustainability goals to the entire agency. To identify appropriate Team members, ask the following questions:

1. *Which job roles most affect agency operations that have a direct environmental impact?*
2. *Who needs to participate on the Team to ensure action plans are implemented?*
3. *Which staff has the resources to participate on the Team?*

The appropriate number of people on the Team will depend on the number of agency facilities and complexity of agency operations. A minimum of 3-5 employees will probably be sufficient, although individual facilities within a single agency may want to establish their own team.

Possible Staff Functions to Include on a Agency Sustainability Team		
Purchasing Operations/Facilities Fiscal Health & Safety	Environmental Management/Planning Engineering Information Technology	Human Resources Students (for colleges & universities) Other tenants in a shared facility

Once you have identified the key employees to be part of the Team, work with top-level agency management to authorize/request people to participate. Where possible, offer incentives for participation (e.g., include as part of job duties) make sure to provide a clear definition of the goals, responsibilities, and time commitments.

### **B. Assess Operations and Identify Environmental Impacts**

The first step for the Team is to identify and describe key operations, the activities related to these operations, and the broad environmental impacts associated with these activities:

**Identify the major operations** the agency carries out and the activities involved, for example:

- ➔ Maintaining roads (operation)—driving vehicles, procuring road materials, de-icing (activities)
- ➔ Processing tax returns (operation)—paper use, copying, printing (activities)
- ➔ Housing students, inmates, clients (operation)—heating and cooling, food preparation (activities)

**Conduct a quick inventory** of the environmental impacts associated with the activities listed above, for example

- ➔ Energy/fuel use associated with vehicles, heating and cooling buildings, computer use
- ➔ Chemical generation associated with product purchases (e.g., mercury thermometers), use of pesticides for landscaping, and cleaning chemicals
- ➔ Resource use associated with consumption of paper, water, food
- ➔ Land impacts related to where buildings are situated, wastes disposed, etc.

Select a range of issues to focus on based on which of the activities the agency has direct control or influence over.

Gather agency operational baseline data on energy use (utility bills), materials consumption, (purchasing records), waste generation (disposal records/fees), and other environmental impacts, wherever possible. Agencies should also work to identify the costs associated with each activity and impact. The State Sustainability Program has collected environmental and cost data on many of these areas, so agencies should contact program staff prior to gathering baseline data.

Agencies may want to use the sample chart below to help them create a broad picture of their operations, activities and associated environmental impacts. A blank version of this chart is available in the appendix.

General Operations	Activities	Energy	Chemicals	Waste	Natural Resources	Health and Environmental Impacts
<i>Building Maintenance</i>	Interior cleaning		X		X	-chemicals affect water quality -indoor air quality -potential worker exposure
	Pest Control		X		X	-water quality -exposure to chemicals
<i>Office Operations</i>	Printing	X	X	X	X	-electricity use by printers -paper use -disposal of paper
	Office Equipment	X	X	X		-air emissions/climate change -end-of-life disposal

## Road Map Step 2 ➡ Broadly Define Long-Term Goals

Creating a set of long-term goals can be helpful in stimulating ideas for action and in making decisions to prevent future problems. In light of the Step 1 findings on how the agency's activities impact the environment, the Team should do a quick brainstorm to generate 5-10 examples of what the agency's operations would look like if they were sustainable. The following questioning strategy, based on sustainable principles, can encourage this creative thinking:

*Given the basic service our agency provides, how could we provide that service in ways that reduce our dependence on...*

Environmental Impact	Long-Term Sustainable Solutions
<i>Fossil fuels, metals and minerals?</i>	<ul style="list-style-type: none"><li>• Energy for building heating and cooling from renewable sources such as solar, wind, hydro, biomass, etc.</li><li>• All of our vehicles operate on clean fuels</li></ul>
<i>Persistent and/or toxic synthetics, chemicals?</i>	<ul style="list-style-type: none"><li>• Food purchased is grown organically or with IPM methods and from local farms</li><li>• All pest control activities use no or few pesticides through comprehensive integrated pest management programs</li></ul>
<i>Consumption of resources and degradation of natural systems?</i>	<ul style="list-style-type: none"><li>• All of our paper products contain 100% recycled content</li><li>• Wood products come from sustainably harvested forests</li><li>• Only native plantings for lawns and grounds</li></ul>

Once the Team has identified several general long-term sustainability goals, it should move to Road Map Step 3 to identify and prioritize more specific short-term actions that can be implemented.

## Road Map Step 3 ➡ Identify and Prioritize Short-term Actions

Inevitably, there will be a gap between an agency's current activities and impacts versus the long-term vision of how a sustainable agency should look. This step is designed to help your agency define how to close that gap over time by identifying a list of what actions it can take **now** to move toward the vision of a sustainable agency, thereby reducing environmental impacts and lowering operational costs.

Section 2 of this Planning and Implementation Guide offers ideas in eight different environmental categories that can be used as a starting point. The State Sustainability Program office has collected examples of practices already implemented successfully within state government, many of which are listed on the web site <http://www.mass.gov/envir/sustainable/>. The Team should use these examples, as well as its own proposals, to put together a broad list of ideas that could help move the agency toward more sustainable operations.

Once the Team has brainstormed a list of potential actions, it can prioritize which actions to pursue by considering the following questions:

Question	Yes	No
Will the action result in environmental/health benefits?	<input type="checkbox"/>	<input type="checkbox"/>
Are the environmental benefits significant?	<input type="checkbox"/>	<input type="checkbox"/>
Will the action result in a cost savings over the life of the product/action?	<input type="checkbox"/>	<input type="checkbox"/>
Are the cost savings significant?	<input type="checkbox"/>	<input type="checkbox"/>
Will the action support progress in one or more of the Implementation Guide priority areas?	<input type="checkbox"/>	<input type="checkbox"/>
Is the time frame and ease of implementation manageable given agency resources?	<input type="checkbox"/>	<input type="checkbox"/>
Would this activity help to maintain compliance and meet a regulatory requirement?	<input type="checkbox"/>	<input type="checkbox"/>
Could the action reduce compliance obligations (e.g., eliminating a hazardous waste)?	<input type="checkbox"/>	<input type="checkbox"/>
Is this issue of significant concern to employees, or those who use your services, etc?	<input type="checkbox"/>	<input type="checkbox"/>
Does the activity have a clear educational value or provide high visibility?	<input type="checkbox"/>	<input type="checkbox"/>

Those actions that have a "yes" answer to many or all of the questions should obviously be given highest priority. The long-term vision developed in Step 2 also should be considered as the Team selects actions. While elements of the vision may not be practical today, the Team should pursue actions that make future efforts easier to pursue (for example, design a new building's roof angles to allow solar panels to be added later if current economics don't make that choice viable today).

After selecting priority actions, the Team can create a sustainability workplan that assigns responsibilities and due-dates for implementation. **Agencies may want to use the sample workplan in the appendix to guide them in developing their list of priorities.**

<p><b><i>What if my agency has a small staff and only leases office space?</i></b></p>	<p><b><i>Examples of Actions for Small Offices in Leased Space</i></b></p> <ul style="list-style-type: none"> <li>• <b>Purchasing</b> – buy recycled, remanufactured products, energy efficient office equipment</li> <li>• <b>Building contract/lease</b> – include conditions in the lease agreement regarding recycling, non-toxic cleaners, energy efficiency, etc.</li> <li>• <b>Waste prevention</b> – paper use reduction, double-sided copying, behavior changes to increase recycling</li> <li>• <b>Flex time</b>, telecommuting, encourage employees to use public transit</li> <li>• <b>Energy efficiency</b> in computer use, turn off lights, etc.</li> <li>• <b>Choice of office location</b> – select a site close to public transit and other services</li> </ul>
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Planning for sustainability should also be accompanied by appropriate education and training of agency employees. Training can take many forms, from a formal workshop on one or more environmental topics, to simple reminders placed around the office. The State Sustainability Program has developed and will continue to develop various educational sessions and tools that agencies can use to educate staff and promote sustainable practices. Agencies should consider sending appropriate staff to the no-cost annual Environmentally Preferable Products Vendor Conference in October where various sustainability topics are covered in a wide array of workshops. For more information, go to: <http://www.state.ma.us/osd/enviro/events.htm>.

Below are several training and education ideas agencies can incorporate in their sustainability workplan to ensure successful implementation of the strategies identified in the plan:

- ➔ Host a sustainability breakfast for agency staff to brainstorm sustainability ideas
- ➔ Post environmental reminders around the office (e.g. recycle paper here, turn off lights, etc.-use State Sustainability sign templates)
- ➔ Use the state training contract to train staff on EMS development
- ➔ Take advantage of no or low cost trainings available from Statewide Contractors (e.g. Hazardous Material Collection, Electrical Supplies vendors, etc.)
- ➔ Send key staff to free or low-cost workshops (check state sustainability web page for events)
- ➔ Ask state sustainability staff to host a training session for your Team and/or other staff
- ➔ Incorporate sustainability activities and information into existing communication strategies such as inter- and intra-agency newsletters, internet and intranet pages, bulletin boards, etc.

Once the workplan has been finalized and approved, agencies should begin implementing sustainable practices as identified in the workplan. Such efforts can begin even while agencies are developing their Agency Sustainability Plan, identifying management systems, and developing other long-term sustainability strategies.

## Step 4 Formalize Management Systems and Integrate Sustainability Into Decision-Making

### A. Integrating Sustainability Into Operations

While developing a sustainability workplan is key, it is just as important to devise an ongoing process through which sustainability priorities are actually carried out by an agency regardless of individual commitment. The Team should work with agency management to develop an internal system to ensure that the agency sustainability workplan is implemented throughout the agency and maintained over time.

Within each agency, choices are made by various people at certain points along the decision making process. At these key junctures, decisions can have long-term repercussions on the agency's environmental impacts. Teams should work to identify these key decision points and develop a process to ensure that environmental considerations and actions in the Sustainability Plan are acknowledged and incorporated into these decision points.

The Team should consider the following questions:

1. *Where are decision points that affect material/energy flows, e.g., purchasing, budget approvals, building design, etc.?*
2. *How can we ensure sustainability questions get asked when these decisions are made?*
3. *How can we ensure that when changes are planned that sustainability issues are considered and opportunities pursued, e.g., building a new building, buying new vehicles, etc?*

Examples of Decision Points	How to Integrate Sustainability
Purchasing - Choice of product or service purchases	<ul style="list-style-type: none"><li>• Incorporate environmentally-preferable options into specifications, bids, RFP's</li><li>• Train employees who make purchases in environmental impacts of their choices and preferable alternatives</li><li>• Add check-off on purchase authorization form to confirm environmental options considered before key purchases approved, e.g., chemicals, energy-using equipment</li></ul>
New construction, building modifications	<ul style="list-style-type: none"><li>• Select architect, builder, etc. with sustainable design experience</li><li>• Require LEED certification or equivalent for contractors and building</li><li>• Specify materials that meet environmental criteria</li></ul>
Budget meetings	<ul style="list-style-type: none"><li>• Incorporate criteria that requires that those requesting budget approval for new projects demonstrate that environmental impacts are considered and minimized where feasible</li></ul>
Facilities management	<ul style="list-style-type: none"><li>• Make sure solid waste contractors are asked to propose recycling options with associated cost comparisons</li></ul>

## B. Developing a Management System

Once key decision points have been identified, agencies should work to develop some sort of management system that formalizes and allocates environmental responsibilities among its staff, as required by Executive Order No. 438. Developing such a system will ensure that sustainability policies and programs will be incorporated into on-going and long-term agency operations.

Given the diversity of agencies' activities and responsibilities, a sustainability management system should be designed to fit the size and breadth of an agency's operations. A small office with only ten employees may simply choose to develop an environmental office policy and raise environmental issues at their staff meetings, while an agency with multiple facilities and large impacts may elect to develop a formal Environmental Management System (EMS). Regardless of the type and complexity of the management system chosen, it is critical that systems are formally written and approved by the Agency Commissioner/Director and distributed among all appropriate staff. It is also important to develop a system that remains flexible so that changes in agency structure, operations and/or circumstances can be easily addressed in revisions to the document. For additional information on EMS visit <http://www.state.ma.us/envir/sustainable/resources/>.

Examples of ways to develop sustainability management systems:

- Integrate environmental responsibilities into job descriptions and performance reviews
- Incorporate environmental considerations into standard operating procedures, including education, training and information dissemination
- Establish a written agency sustainability policy that sets a broad vision for staff (see DEP Green Office Policy in Appendix 1)
- Provide the opportunity for employee feedback to review program efforts
- Include top-level management in the activity prioritization process, or at least keep them informed when an action plan is developed. Ask management to reinforce the importance of these activities to agency staff at a staff meeting, and/or by sending out periodic emails
- Ask designated individuals for periodic updates on progress
- Perform spot checks, e.g., is white paper being recycled or is it in the regular trash?
- Offer recognition - awards, highlight work in staff meetings



## **Road Map Step 5 Track and Report on Progress**

A key element of any successful sustainability effort is to regularly track and report on progress in meeting sustainability goals and objectives **and make changes as necessary to ensure continuous improvement**. Executive Order No. 438 requires the State Sustainability Coordinating Council to submit an annual progress report to the Governor and requires agencies to **“track and measure the results of sustainability programs on an annual basis”** in cooperation with the Council.

### **Agency Tracking and Reporting Form**

The Council has developed an *Agency Tracking and Reporting Form* that will be issued each year by the Council, and should be used by agencies to describe and account for their impacts and sustainability efforts on an annual basis. The form requests quantitative and qualitative information on a variety of sustainability topics including:

- Sustainability Education and Planning
- Energy Efficiency and Greenhouse Gas Reductions
- Mercury & Other Toxic Use Reduction
- Solid Waste Management
- Environmentally Preferable Purchasing
- Water Usage and Conservation Efforts
- Vehicle Equipment & Use
- Sustainable Development/Smart Growth

Data and information generated from the Form will be compiled into the annual *State Sustainability Report* to the Governor, as required by Executive Order No. 438.

### **Continuous Improvement**

In addition to this annual tracking, agencies should conduct their own review of their sustainability program. An annual review will provide agencies with an opportunity to step back and consider how well the sustainability program is working. Key questions the Sustainability Team should consider are:

1. How effectively are we performing against our goals and targets?
2. If our performance is not meeting expectation:
  - What is the problem e.g., resources, training, failed to revise plans when change occurred, etc.?
  - What steps would prevent this problem in the future?
3. Is our management system effective?
  - Are we catching mistakes before they become big problems?
  - Are we adapting to change effectively?
4. What are upcoming changes that may affect what we need to manage, such as new environmental regulations, changes in our operations, budgets, etc. that may affect how we manage environmental issues?
5. What can we do to ensure continuous improvement?

## Conclusion

Achieving sustainability may seem overwhelming, especially to those who have had little or no experience with the concept. Devising, implementing, and evaluating sustainability efforts, however, do not need to take an extensive amount of time or resources. Rather, agency sustainability practices can be implemented through a simple step-by-step process that each agency can customize according to its own scope, abilities, resources, and impacts. Agencies can rely on a wealth of existing information and resources, the experience of the other state agencies, state sustainability environmental staff, and expertise in their own agencies.

At a minimum, agencies should strive to incorporate some of the key questions and environmental/health issues discussed in the Guide into their decision-making processes to ensure that significant impacts are addressed. Additionally, agencies can focus on those issues that have clear economic benefit and that are manageable given existing resources. Agencies should never lose sight of long-term sustainability goals and remember that true sustainability will result from openness to new ideas, and inclusion of staff at all levels.

Through changes in daily operations, ongoing programs, and long-range planning, state agencies can have a significant positive impact on the environment, economic efficiency of state government and the character of Massachusetts' communities.

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# APPENDIX 1 - State Sustainability Coordinating Council

Members appointed by Executive Order #438:

- |  |           |
|--|-----------|
| 1. Executive Office for Administration and Finance     | (ANF)     |
| 2. Executive Office of Environmental Affairs           | (EOEA)    |
| 3. Executive Office of Health and Human Services       | (EOHHS)   |
| 4. Executive Office of Public Safety                   | (EOPS)    |
| 5. Executive Office of Transportation and Construction | (EOTC)    |
| 6. Board of Higher Education                           | (BHE)     |
| 7. Department of Conservation and Recreation*          | (DCR)     |
| 8. Department of Correction                            | (DOC)     |
| 9. Department of Environmental Protection              | (DEP)     |
| 10. Department of Public Health                        | (DPH)     |
| 11. Division of Capital Asset Management               | (DCAM)    |
| 12. Division of Energy Resources                       | (DOER)    |
| 13. Massachusetts Highway Department                   | (MassHwy) |
| 14. Office of Technical Assistance                     | (OTA)     |
| 15. Operational Services Division                      | (OSD)     |

Voluntary Members:

- |   |            |
|---|------------|
| 1. Massachusetts Bay Transportation Authority | (MBTA)     |
| 2. Massachusetts Port Authority               | (MassPort) |
| 3. Massachusetts Turnpike Authority           | (MTA)      |
| 4. Massachusetts Water Resources Authority    | (MWRA)     |
| 5. University of Massachusetts                | (UMass)    |

\* The Department of Conservation and Recreation (DCR) was legislatively created by combining the Department of Environmental Management and the Metropolitan District Commission, which were original Council designees in Executive Order No. 438.

# APPENDIX 2 - Commonwealth Development Principles

## Enhancing Our Commonwealth

The Office for Commonwealth Development is dedicated to careful stewardship of our natural resources, wise investment in public infrastructure and the expansion of opportunity for all our residents. The beauty and bounty of Massachusetts are the result of decisions made in past generations; our choices today must create value and opportunity for all our residents now and in the future. To improve the health and wealth of all our communities, we must draw together the creativity of our people, the vitality of markets, the resources of government, and the natural treasures we have inherited to design and build our future.

The quality of life in all of Massachusetts depends upon decisions made in each unique community. Planning for growth in a vibrant Commonwealth means working with those communities to integrate the diverse needs for housing, jobs, services, transportation and historic, cultural, and natural resources. In order to achieve these objectives, the Office for Commonwealth Development will

- Encourage the coordination and cooperation of all agencies.
  - Invest public funds wisely in smart growth and equitable development.
  - Give priority to investments that will deliver living wage jobs, transit access, housing, open space, and community-serving enterprises.
  - Be guided by the following principles:
1. **Redevelop first.** Support the revitalization of town centers and neighborhoods. Encourage reuse and rehabilitation of existing infrastructure rather than the construction of new infrastructure in undeveloped areas. Give preference to redevelopment of brownfields, preservation and reuse of historic structures and rehabilitation of existing housing and schools.
  2. **Concentrate development.** Support development that is compact, conserves land, integrates uses, and fosters a sense of place. Create walkable districts mixing commercial, civic, cultural, educational and recreational activities with open space and housing for diverse communities.
  3. **Be fair.** Promote equitable sharing of the benefits and burdens of development. Provide technical and strategic support for inclusive community planning to ensure social, economic, and environmental justice. Make regulatory and permitting processes for development clear, transparent, cost-effective, and oriented to encourage smart growth and regional equity.
  4. **Restore and enhance the environment.** Expand land and water conservation. Protect and restore environmentally sensitive lands, natural resources, wildlife habitats, and cultural and historic landscapes. Increase the quantity, quality and accessibility of open space. Preserve critical habitat and bio-diversity. Promote developments that respect and enhance the state's natural resources.
  5. **Conserve natural resources.** Increase our supply of renewable energy and reduce waste of water, energy and materials. Lead by example and support conservation strategies, clean power and innovative industries. Construct and promote buildings and infrastructure that use land, energy, water and materials efficiently.
  6. **Expand housing opportunities.** Support the construction and rehabilitation of housing to meet the needs of people of all abilities, income levels and household types. Coordinate the provision of housing with the location of jobs, transit and services. Foster the development of housing, particularly multifamily, that is compatible with a community's character and vision.
  7. **Provide transportation choice.** Increase access to transportation options, in all communities, including land and water based public transit, bicycling, and walking. Invest strategically in transportation infrastructure to encourage smart growth. Locate new development where a variety of transportation modes can be made available.
  8. **Increase job opportunities.** Attract businesses with good jobs to locations near housing, infrastructure, water, and transportation options. Expand access to educational and entrepreneurial opportunities. Support the growth of new and existing local businesses.
  9. **Foster sustainable businesses.** Strengthen sustainable natural resource-based businesses, including agriculture, forestry and fisheries. Strengthen sustainable businesses. Support economic development in industry clusters consistent with regional and local character. Maintain reliable and affordable energy sources and reduce dependence on imported fossil fuels.
  10. **Plan regionally.** Support the development and implementation of local and regional plans that have broad public support and are consistent with these principles. Foster development projects, land and water conservation, transportation and housing that have a regional or multi-community benefit. Consider the long-term costs and benefits to the larger commonwealth.

# APPENDIX 3 - Agency Sustainability Plan TEMPLATE



## Introduction

This sustainability plan template is designed to provide agencies with a simple framework for the development and writing of a sustainability plan as required by Executive Order No. 438. Final Sustainability Plans must be **submitted to the State Sustainability Coordinating Council by October 8, 2004**. State Sustainability Program staff will be available during the plan writing timeframe to assist agencies with their efforts. For assistance with writing your plan contact:

Eric Friedman	Director	<a href="mailto:eric.friedman@state.ma.us">eric.friedman@state.ma.us</a>	617-626-1034
Charlie Tuttle	Asst Director	<a href="mailto:charles.tuttle@state.ma.us">charles.tuttle@state.ma.us</a>	617-626-1043
Jaclyn Emig	Project Manager	<a href="mailto:jaclyn.emig@state.ma.us">jaclyn.emig@state.ma.us</a>	617-626-4910

The Program intends for this Template to be used in conjunction with the *State Sustainability Planning and Implementation Guide* (the Guide), and refers to specific sections of this Guide. The Guide is available on the Program website, <http://www.mass.gov/envir/sustainable>, or from Program staff.

**Once an Agency Sustainability Plan is developed, agencies will only be responsible for reviewing and updating the information in the Plan each year, and will not have to develop a new plan (unless major changes are in order)**

## Instructions

The Template is broken into 5 Sections with sub-headings that contain specific questions on information expected to be included in the plan. Agencies should:

1. Review the *State Sustainability Planning & Implementation Guide* before writing the Plan:
  - a. focus on Section 2 for specific ideas and examples of agency strategies and actions
  - b. focus on Section 3 for specific information on planning and education
2. Respond to the questions included in brackets [ ] in each Section of the Template. These questions are included to help guide agencies in writing the plan, but should not be considered all-inclusive. Agencies may add any additional information they feel is appropriate.
3. Delete all italicized language upon completing each section of the Plan (your Agency Plan should not include the guidelines, these are included to help with writing the Plan).
4. Identify who at your agency needs to approve and sign the Plan, prior to submitting to the Council.
5. Agencies may want to submit a draft copy of their Plan to the Council in the summer of 2004 to receive feedback and comments, prior to submitting their final copy.
6. Agencies must submit a final copy of their Plan by **October 8, 2004** to the Council:

*Eric Friedman, Director, State Sustainability Program*  
[eric.friedman@state.ma.us](mailto:eric.friedman@state.ma.us)  
*Executive Office of Environmental Affairs*  
*251 Causeway Street, 9<sup>th</sup> Floor*  
*Boston, MA 02114*

[Insert Agency Logo]

# **[Agency Name] Sustainability Plan**



**Date:** \_\_\_\_\_  
**Agency Coordinator:** \_\_\_\_\_  
**Phone:** \_\_\_\_\_  
**Email:** \_\_\_\_\_

This Sustainability Plan has been reviewed and approved by ( \_\_\_\_\_ *Insert Designee Name* \_\_\_\_\_ ) of ( \_\_\_\_\_ *Insert Agency Name* \_\_\_\_\_ ) on ( \_\_\_\_\_ *Insert Date* \_\_\_\_\_ ).

\_\_\_\_\_  
*Signature of Agency Head or other Appropriate Designee*

## **1. Agency Information, Impact Identification and Sustainability Team**

*Refer to "Road Map Step 1" of the Planning and Implementation Guide before writing this section of the Plan.*

*This section is intended to provide basic information about the agency, its roles and responsibilities, existing impacts associated with operations, and any costs associated with such activities. Agencies should also identify their Sustainability Team in this section. More specifically, agencies should include information on the following:*

### **1.1 Agency Description and Scope**

*[Include info on agency mission, size, number of staff, number of facilities, location of facilities, number of buildings, etc]*

### **1.2 Agency Impacts on the Environment and Human Health**

*[Identify the major operational activities of your agency that effect the environment and human health. e.g. shuttling clients, printing reports, using electricity, watering lawns, etc.*

*Where feasible, identify the specific impacts of these operational activities, e.g. agency uses X gallons of water per year, X kilowatt-hours per year, etc). Use the 8 sections of implementation guide as a framework (i.e. energy, waste, mercury and hazardous substances, buildings and renovations, water, purchasing, regulatory matters, and natural resources), and identify any additional impacts.]*

**NOTE:** The State Sustainability Program is collecting statewide data for some agency operational activities through the **Agency Tracking and Reporting Form**. Data collected statewide for most agencies includes: fuel oil consumption, gasoline consumption, diesel fuel consumption, CNG consumption and mercury collection. To view the Tracking Form visit the website at <http://www.mass.gov/envir/sustainable> or contact State Sustainability Program staff at [Jaclyn.emig@state.ma.us](mailto:Jaclyn.emig@state.ma.us).



### 1.3 Agency Operational Costs

*[Identify the financial costs of your agency's activities identified above, e.g. X agency spends \$X per year on electricity, \$X on fuel oil, \$X on hazardous waste disposal, etc.]*

### 1.4 Agency Sustainability Team Members

*[List members of your team(s), the roles they play, meeting schedule, or other relevant information].*

## 2. Long-Term Goals/Vision

*Refer to "Road Map Step 2: Broadly Define Long-term Goals" before writing this section of the Plan.*

### 2.1 Long-Term Goals

*[Based on the exercise in "Road Map Step 2", please identify your agency's long-term goals for sustainable operations. These can be as broad as is necessary and are not intended to be a list of specific actions the agency will be taking.]*

*Agencies may wish to use this section to include a vision statement, environmental policy statement, letter of commitment from Commissioner/Director, or other broad goal that relates to the agency's long-term goals.]*

## 3. Short-term Actions and Priorities

*Refer to "Road Map Step 3: Identify and Prioritize Short-term Actions" before writing this section of the Plan. Agencies should use this section to identify the priority areas they plan to focus on over the next 1-3 years.*

### 3.1 Priority and Areas Goals

*[List 3-5 priority areas (e.g. recycling, water use, mercury reduction) your agency will focus on, based on the biggest environmental impacts of your agency operations, opportunities for improvement, etc. over the next 1-3 years, and identify key short-term goals associated with these areas (e.g. Establish paper recycling in all offices; Eliminate purchases of mercury-containing products.)]*

### 3.2 Agency Action Steps

*[Agencies should identify specific strategies and actions required to meet short-term goals and address focus areas identified in 3.1.]*

*The Sustainability Workplan (sample chart is available in the Appendix) is designed to help agencies identify appropriate strategies, specific tasks, and individual responsibilities and timeframes and should be submitted as part of the Agency Sustainability Plan. Agencies may wish to replace the "responsible staff" column with Division or Title of responsible person, if appropriate.]*

*For ideas on a variety of strategies and actions steps consult Section 2 of the Planning and Implementation Guide.*

## 4. Management Systems and Institutionalization

Refer to “Road Map Step 4: Formalize Management Systems and Integrate Sustainability Into Decision-Making” before writing this section of the plan.

### 4.1 Integrating Environmental Impacts into Key Decision Points

*[Identify key decision points within your agency and identify the process that will ensure environmental impacts are taken into account at the correct point in the decision-making process. The “Road Map Step 4” has a chart that can be included in this section.]*

### 4.2 Education and Training of Staff

*[Identify ways your agency will educate appropriate staff on sustainability efforts and encourage new ideas within the agency.]*

### 4.3 Management Systems

Refer to “Road Map Step 4: Formalize Management Systems and Integrate Sustainability into Decision-Making”.

*[Identify whether your agency has a formal environmental management system (EMS) in place, or plans to develop an EMS. Agencies without an EMS should identify other ways they will ensure that environmental responsibilities are allocated among staff, and formally incorporated into the agency’s operations.]*

## 5. Tracking Progress and Program/Plan Review

Refer to Road Map Step 5: Track and Report on Progress” before writing this section of the plan

### 5.1 Agency Tracking and Reporting Form

*[Identify the process by which an agency will complete and submit the annual Agency Tracking and Reporting Form to be issued each year to the State Sustainability Council.]*

### 5.2 Continuous Improvement

*[Include a description of the following:*

- the process by which sustainability efforts will be evaluated and monitored to ensure they are working and achieving initial goals*
- the process by which feedback will be encouraged and incorporated into future planning*
- how this sustainability plan will be reviewed and altered (if necessary) and who will be responsible for overseeing this process]*

## Appendix 4 - Agency Sustainability Workplan Worksheet

For Use in Section 3 of the *Agency Plan Template* “Short Term Actions and Priorities” and should be submitted as part of the agency plan.

This worksheet is intended to help agencies develop an action plan to help identify the key sustainable activities the agency wants to address, as well as identify the key staff necessary to ensure program success. The information provided here is for sample purposes only

Sustainable Goal	Benefits	Specific Tasks	Responsible Staff	Timeline
<i>e.g. Increase Mixed Paper Recycling by 10% per year for five years</i>	<ul style="list-style-type: none"> <li><i>Solid waste reduction</i></li> <li><i>Cost savings</i></li> </ul>	<ul style="list-style-type: none"> <li><i>Identify potential vendors through state contract that are the most cost-effective</i></li> <li><i>Award vendor</i></li> <li><i>Publicize new program to staff</i></li> <li><i>Hand out new recycling bins</i></li> <li><i>Begin recycling program</i></li> </ul>	<ul style="list-style-type: none"> <li><i>Karen Smith, Purchasing</i></li> <li><i>Same</i></li> <li><i>John Johnson, Commissioner</i></li> <li><i>Steve Smith, Facilities</i></li> <li><i>Sustainability Team</i></li> </ul>	<ul style="list-style-type: none"> <li><i>January 1, 2004</i></li> <li><i>February 1, 2003</i></li> <li><i>February 15, 2003</i></li> <li><i>February 25, 2003</i></li> <li><i>March 1, 2003</i></li> </ul>

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# APPENDIX 5 - DEP Green Office Policy



JANE SWIFT  
Governor

COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

BOB DURAND  
Secretary

LAUREN A. LISS  
Commissioner

## Massachusetts Department of Environmental Protection **Green Office Policy**

Consistent with our mission of protecting the environment and public health, the Massachusetts Department of Environmental Protection (DEP) is hereby adopting the “DEP Green Office Policy.” This policy lays out a framework for conducting DEP operations in all of our facilities in a manner that conserves and protects natural resources for future generations. In so doing, we will meet our own environmental obligations and moreover, we will set an example of environmental stewardship for other state agencies, public and private entities, and residents of the Commonwealth.

In meeting this policy, the Department will, to the maximum extent practicable:

- Reduce, reuse and recycle waste.
- Reduce energy consumption.
- Minimize water consumption.
- Use environmentally preferable products.
- Facilitate fuel-efficient transportation opportunities for staff travel related to work and commuting.
- Support the DEP Green Team’s charter to facilitate the creative interchange of ideas regarding development of new initiatives designed to meet the aims of this policy.
- Foster a broader understanding of environmental responsibility and stewardship among all Department personnel.
- Measure our performance and seek continual improvement.

This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.

DEP on the World Wide Web: <http://www.state.ma.us/dep>



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